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Journal

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

Four Articles on Leptospirosis

Breakage of Intramedullary Pins

Television in Detroit

Zoning for a Small Animal Hospital

Vol. 139 October 15, 1961 No. 8


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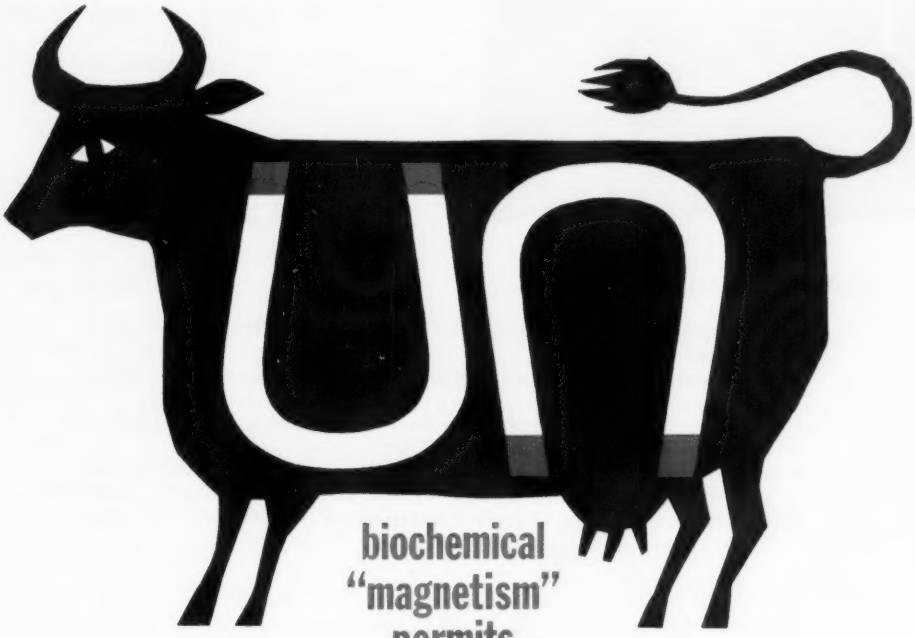

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Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION

Vol. 139 No. 8 October 15, 1961

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Correspondence

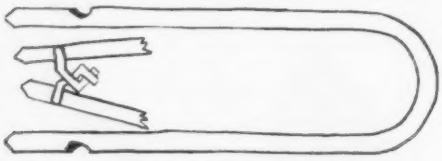
Device for Correction of Vaginal Prolapse in Cattle

September 4, 1961

Dear Sirs:

The article by Robert E. Pierson, "A Review of Surgical Procedures for Correction of Vaginal Prolapses in Cattle," (J.A.V.M.A., 139, Aug. 1, 1961, p. 352), prompted me to send you a brief description of a device I have used on 6 cows during the past year. Results were good in all cases.

The device consists of a stainless steel rod, U-shaped, sharpened on each end, and notched ½ inch from each end on the lateral side. It is 8 inches long and 2 inches wide.



This instrument is inserted from above, starting lateral to and just below the rectum. Each point is kept about 2 inches lateral to the vulvar lip. Insertion is made as deep as possible but does not include the vaginal lining. At the level of the ventral commissure, the points are brought back through the skin. A piece of wire is used to tie the two arms so that a 1-inch aperture remains. Using caps to cover the sharp points probably would be an improvement.

s/William P. Barchfeld, V.M.D.
Apollo, Pennsylvania

Claim to Largest Sheep Flock Challenged

August 1, 1961

Dear Sir:

In the Journal of Feb. 1, 1961 (Vol. 138, p. 171), there appeared the following article:

"Dr. Harry E. Furgeson (COL '41), Anaconda, Mont., the owner of the world's largest flock of purebred sheep, won the grand champion prize for the wool from his flock at the International Livestock Exposition in Chicago, Ill., last November. Dr. Furgeson has more than 10,000 sheep . . . ."

In Australia we have many individually owned flocks of purebred Merinos totaling over 120,000 sheep.

One company, Toomooroo Pty. Ltd., even boasts of a flock of 203,000 purebred Merino sheep which produced a total of 767 tons of wool in one season.

However, though we hate to admit it, the largest purebred flock is in Chile, South America, where there is a flock of purebred Corriedale sheep which

(Continued on p. 844)

CONTENTS—*continued*

THE ORIGINAL MODIFIED LIVE VIRUS HOG CHOLERA VACCINE
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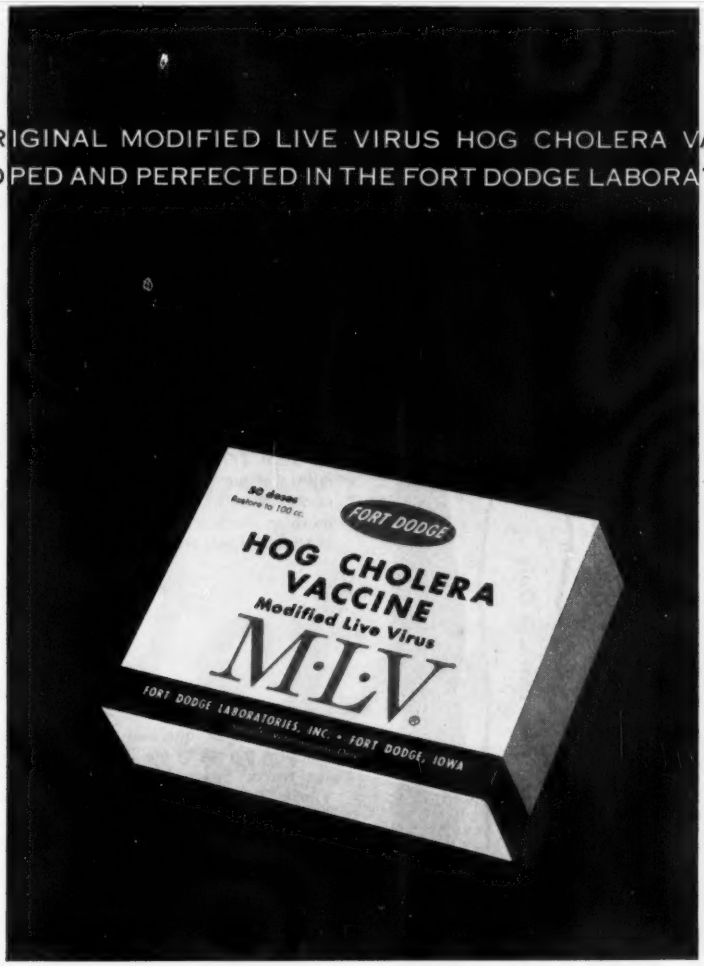

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produce an average of 884 tons of wool a season. (Unfortunately, I do not know the number of sheep.)

While on the subject of statistics, it is of interest that one of Australia's stud sheep companies, the Faulkiner organization, sells over 10,000 stud Merino rams each year.

As far as property size is concerned, the largest sheep holding in Australia is about 1½ million acres, while many properties are well over the million acre mark.

I have a personal friend who has a sheep property in West Australia who owns 800,000 acres and runs one sheep to 40 acres. His is only an average property in that area.

Of course, in the cattle country to the north of Australia, properties are not measured in acres but in square miles. The largest ranch, or "station" as we call such properties, is Alexandria Downs, in the Northern Territory. It has an area of 11,262 square miles (about 7¼ million acres), which is about the same size as Belgium. In length it is 250 miles from north to south and it carries 70,000 Shorthorn cattle of which 11,000 are sold each year.

s/GRACEMARY MACKINNON
Secretary, Australian Wool Bureau
Melbourne, Australia

August 14, 1961

Dear Sir:

There is no question that the largest flocks of sheep in the world are located on the extreme southern tip of South America, in that area known as Tierra del Fuego, with Australia running a close second. However, there is a technicality here. I claim only to own the largest flocks of registered Hampshire sheep in the world and the largest flock of registered Targhee sheep in the world. We have on hand at the present time approximately 5,000 registered sheep of each breed, thus a total in excess of 10,000 registered sheep. Thus, I am not discussing purebreds, but registered animals, and there is a distinct difference.

The report which the JOURNAL cited was from an article written in the *Chicago Tribune* last December at the time of the Chicago International Livestock Show. It was a well-written article but, as is common with this type of newspaper article, details were handled somewhat loosely.

s/H. E. FURGESON, D.V.M.
Anaconda, Mont.

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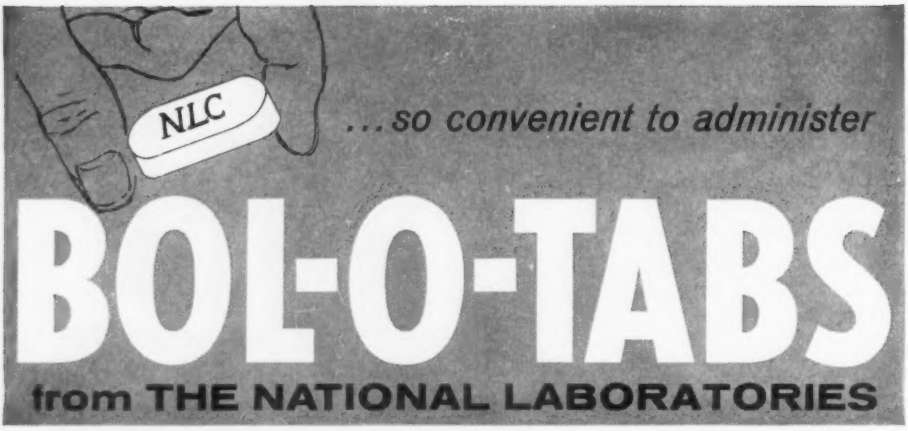

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(Report No. 1)

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THIS is the first in a series of monthly columns written exclusively for Veterinarians. It's our way of keeping you posted on what's happening at the Purina Dog Care Center, where we carry on the major part of our research in dog nutrition, growth, management and reproduction. We hope you find these reports informative and helpful in your own work with dogs. Our topics will range throughout the field of dog care, with special emphasis on nutrition . . . the subject of more than 30 years of continuous research here at Purina. If you want more information, just drop us a line. We'll be happy to hear from you.

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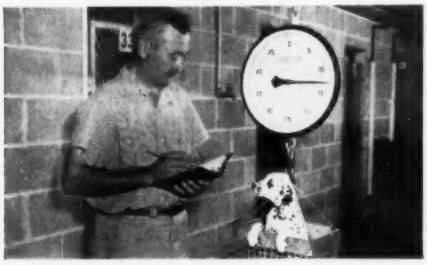

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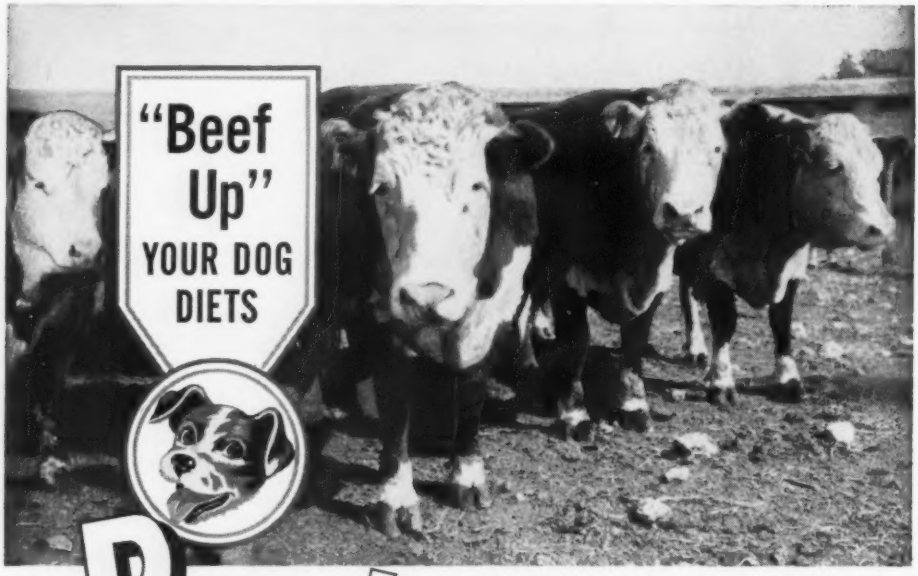

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news from Washington . . .

FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATION

Department of Agriculture Centennial

Public Law 87-161 (H.J. Res. 435)—Provides for recognition of the centennial of the establishment of the Department of Agriculture; approved by the President, Aug. 25, 1961.

Land-Grant System Centennial

Public Law 87-162 (H.J. Res. 436)—Provides for recognition of the centennial of the establishment of the national system of land-grant universities and colleges; approved by the President, Aug. 25, 1961.

National Guard Travel Allowance

Public Law 87-164 (H.R. 4786)—Provides travel and transportation allowances for members of the National Guard and Reserve components when travel takes place in an active duty or an inactive duty training status in compliance with federal directives; approved by the President, Aug. 25, 1961.

Small Business Act Loans

Public Law 87-198 (H.R. 8922)—Amends the Small Business Act to increase by $20,000,000 the amount available for regular business loans thereunder; approved by the President, Sept. 5, 1961.

Hog Cholera Eradication

Public Law 87-209 (S. 1908)—Provides for a national hog cholera eradication program (see JOURNAL, June 15, 1961, adv. p. 12, p. 677; Sept. 1, 1961, pp. 514, 517); approved by the President, Sept. 6, 1961.

COMMITTEE REPORTS

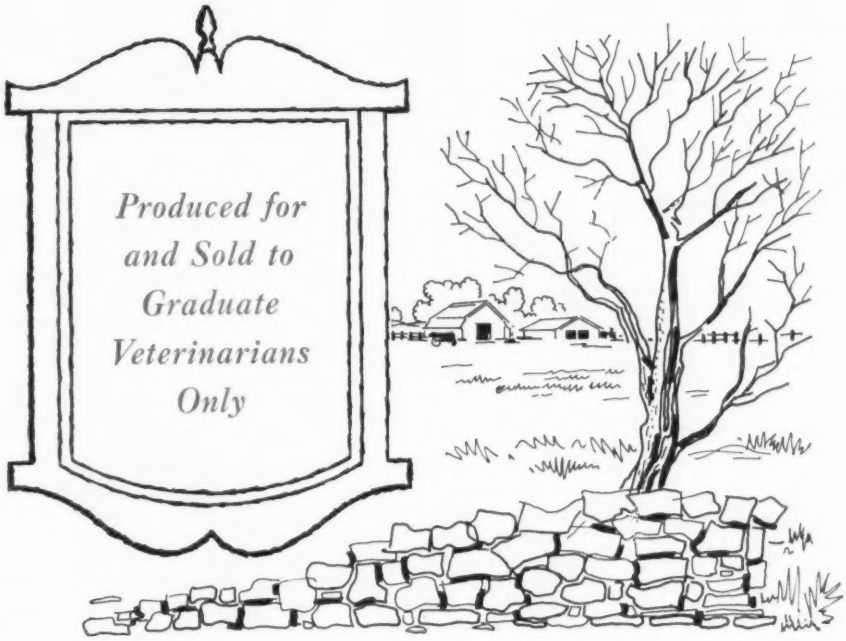
College Academic Facilities Act

House Committee on Education and Labor reported favorably *H.R. 8900*, College Academic Facilities Act, Aug. 29, 1961 (House Report No. 1064). Objective of the bill is a five-year program of grants and loans for building classrooms, laboratories, libraries, and related academic and service facilities. Would authorize matching grants of $180,000,000 annually and long-term loans of $120,000,000 annually for construction of academic facilities.

Educational and Cultural Exchange

House Foreign Affairs Committee reported favorably with amendments *H.R. 8666*, Mutual Educational and Cultural Exchange Act of 1961, Aug. 31, 1961 (House Report No. 1094). One purpose of the bill is to pull together existing laws primarily concerned with educational and cultural aspects of our exchange programs. These laws cover the operation of five major programs—Fullbright amendment to Surplus Property Act of 1944; U.S. Information and Education Exchange Act of 1948; Cultural Exchange Act; Finnish

(Continued on page 852)



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Debt Payments Act of 1949; and Agricultural Trade Development Assistance Act of 1954, known as *Public Law 480*. The bill does not include many other exchange programs such as ICA, AEC, and NIH.

Health Services and Facilities

Senate Labor and Public Welfare Committee favorably reported with amendments *H.R. 4998*, Community Health Services and Facilities Act of 1961, Aug. 31, 1961 (Senate Report No. 845). Three major objectives to be achieved through provisions of bill are: (1) to increase availability, scope, and quality of community health services and facilities in meeting health needs of chronically ill and aged; (2) to increase and expand research to more effectively develop and utilize hospitals and other medical care facilities; (3) to continue grants to assist in construction of health research facilities. Among the provisions of the bill are: (1) to extend authorization under Hill-Burton Act for loans for construction of hospitals and other medical facilities until June 30, 1964; (2) to increase the appropriation ceiling for hospital research grants, and to extend the program to medical facilities other than hospitals; (3) to authorize appropriations for grants for the construction and equipping of experimental or demonstration hospitals and other medical facilities; (4) to extend until June 30, 1965, the matching grant program for the construction of health research facilities; authorization would be increased from present $30,000,000 to $50,000,000 per year. This bill was cleared for Presidential action as a result of the House's adopting the conference report on Sept. 20, 1961.

Self-Employed Pension Plan

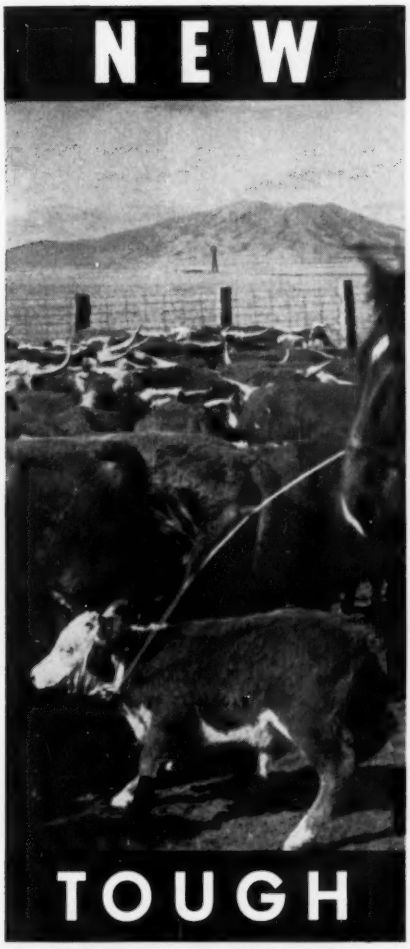
Senate Finance Committee transmitted to the Senate on Sept. 13, 1961, *H.R. 10*, Self-Employed Individual Tax Retirement Act of 1961, as amended in Committee (Senate Report No. 992). The Committee rejected, by a nine to six vote, the amendment which would permit anyone not covered by a pension plan to purchase up to $300 in tax-free Government bonds for retirement purposes (see JOURNAL, Oct. 1, 1961, p. 738). Senate expects to consider *H.R. 10* during the second session, 87th Congress. Reports indicate Senate support for the bill is increasing rapidly. Among those who favor enactment are Proxmire (D., Wis.), Wiley (R., Wis.), Saltonstall (R., Mass.), Moss (D., Utah), Capehart (R., Ind.), and Allott (R., Colo.).

New Disarmament Agency

Senate Foreign Relations Committee favorably reported *S. 2180* with amendments, a bill to establish a new government agency within the State Department, the U.S. Disarmament Agency for World Peace and Security (Senate Report No. 882).

Poultry Inspection Act

House Report No. 1105 gave a favorable recommendation to *H.R. 7866* with amendments, Sept. 1, 1961. The bill clarifies the language of the Poultry Products Inspection Act so that the act applies to the Commonwealth of Puerto Rico and the Virgin Islands.



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98th AVMA Convention Allied Group Conference Reports

American College of Laboratory Animal Medicine

The American Board of Laboratory Animal Medicine has officially changed its name to the American College of Laboratory Animal Medicine. This action was taken at its annual meeting on August 24 in Detroit. Further, the title of those who have qualified for full membership was changed from "fellow" to "diplomate."

The requirements for qualification for diplomate were reviewed and revised. These requirements are now: (1) membership in the AVMA; (2) a master's degree and three years of approved experience, two years of training in an approved program, and three years of approved experience, or five years of approved experience; (3) completion of a written examination; (4) presentation of an approved written dissertation on some phase of laboratory animal medicine; and (5) passage of an oral examination. The written examination can be taken at any time, preferably after an approved curriculum of post graduate study has been completed. The applicant need not wait until the experience requirement has been fulfilled.

Changing of the term of office of the officers of ACLAM from three years to one year was approved. The office of vice-president was discontinued, and the office of president-elect was created. A committee was appointed to revise the constitution and by-laws to conform with the changes agreed upon. It was also agreed that the term "Dipl. ACLAM" was not to be used in published material unless the proposed usage was first approved by the ACLAM Board.

Other action taken at the meeting was unanimous approval of a resolution opposing the several bills introduced in Congress to license research institutes and research individuals that use animals in research. It was voted that ACLAM apply for membership in the National Society for Medical Research.

As a token of appreciation and esteem, the president, Dr. Benjamin D. Fremming (COL '46) presented a plaque to Dr. Nathan R. Brewer (MSU '37), Chicago, Ill., thanking him for his outstanding services as co-founder and first president of the college.

American Board of Veterinary Public Health

The annual meeting of the American Board of Veterinary Public Health was held on August 20 in Detroit. Twenty diplomates were present.

Total number certified by the Board is now 99. Eight successfully completed the examination in 1961.

The meeting of the examining committee of the Board which was held last June was reported at the meeting. New examining procedures will be adopted for the certification of diplomates in the American Board of Veterinary Public Health. They will now include both written and oral examinations. Written examinations will be given at certain designated schools and oral examinations will be given at the annual AVMA convention.

Application forms have also been revised to better serve the purpose of gathering information on applicants. A newly formed examining committee consists of: Drs. William Hinshaw (MSU '23), chairman; Martin Hines (OSU '46); Col. Robert Hummer (UP '34); John Helwig (OSU '37); and Ival Merchant (COL '24).

Col. Neil MacEachern (AUB '41), Colorado Springs, Colo., and Dr. Earl Chamberlayne (ONT '41), Washington, D.C., were elected to the governing council to serve through January, 1963.

American Animal Hospital Association

A semi-annual official membership meeting of the American Animal Hospital Association was held August 23 in Detroit. It was attended by approximately 70 people.

Also during the AVMA convention a joint meeting of the AVMA Board of Governors and the AAHA Administrative Council was held for a discussion of matters of common interest. Hospital zoning, evaluation, and consultation services were given major consideration.

Dr. Lester R. Barto (UP '30), Basking Ridge, N. J., is president of the association, and Dr. Frank Booth (MSU '32), Elkhart, Ind., is secretary.

American Association of Veterinary Bacteriologists

The tenth annual meeting of the American Association of Veterinary Bacteriologists was held in East Lansing at the College of Veterinary Medicine, Michigan State University, on August 18 and 19.

At the meeting members expressed approval of the AVMA endorsement of the policy statement issued by the National Committee for Progress in Medical Research opposing federal legislation which would restrict, and, in some instances, prohibit any scientific investigation involving the use of experimental animals.

Three major presentations were made at the scientific meeting. One was entitled "A Progress Report on Bovine Tuberculosis Studies at Michigan State University. It was presented by Drs. W. L. Mallman, V. A. Mallman, and D. A. Willigan (ONT '52). Another presentation was entitled, "Germ Free Studies at Michigan State University," and was presented by Drs. C. K. Smith (MSU '51), D. T. Clark, and G. L. Waxler (ILL '53). The third presentation was a workshop and panel discussion entitled, "Evaluation and Goals of Teaching Veterinary Microbiology." It was conducted by Drs. J. P. Newman (KSU '43), E. H. Bohl (OSU '44), J. R. Collier (OSU '32), and A. L. Kleckner (GA '53).

Officers of the AAVB for 1961-1962 are: Drs. J. P. Newman (KSU '43), East Lansing, Mich., president; A. L. Kleckner (GA '53), Athens, Ga., president-elect; and C. H. Cunningham (ISU '38), East Lansing, Mich., secretary-treasurer.

American Association of Veterinary Parasitologists

The American Association of Veterinary Parasitologists met on August 20, at the School of Veterinary Science and Medicine, Purdue University.

Two symposiums were presented at the meeting. One was entitled, "Sources of Additional and New Funds for Research in Veterinary Parasitology," and the other, "Graduate Training Programs in Veterinary Parasitology."

Reports were given by Drs. J. C. Trace (OSU '49), H. J. Smith (ONT '58), E. C. McManus (ISU '44), and R. T. Haberman (MSU '36). Dr. J. H. Drudge (MSU '43), Lexington, Ky., was installed as president, and Dr. Donald E. Cooperrider (OSU '36), Kissimmee, Fla., was elected and installed as secretary-treasurer.

American Association of Avian Pathologists

The American Association of Avian Pathologists met in Detroit on August 21. About 65 members attended.

A number of resolutions were passed at the meeting to encourage a more active national and state effort to improve research activities and methods of control of avian diseases. The publication of an avian disease diagnostic manual was planned.

A great deal of the discussion at the business meeting was concerned with *Avian Diseases*, the American Association of Avian Pathologists' publication. The association has a current membership of 263 and a subscription list of 1,037, including 373 foreign subscribers.

Officers elected at the session are: Drs. B. R. Burmester (MSU '51), East Lansing, Mich., president; P. P. Levine (COR '32), Ithaca, N.Y., vice-president; and G. H. Snoeyenbos (MSU '45), Amherst, Mass., secretary-treasurer.

American Veterinary Radiology Society

The annual meeting of the American Veterinary Radiology Society was held on August 21 in Detroit.

Appearing on the scientific program were: W. L. Simpson, M.D., who discussed "Cancer Clues from Comparative Medicine;" Dr. W. C. Banks (TEX '41), who discussed "Selected Radiographic Conditions in the Feline;" and Dr. N. B. Tennille (OSU '33), who discussed "Positioning of Animals for Radiography."

Officers elected at the meeting are: Drs. N. B. Tennille (OSU '33), Stillwater, Okla., president; W. H. Crago (OSU '46), Youngstown, Ohio, president-elect; W. C. Banks (TEX '41), College Station, Texas, vice-president; and J. J. Fishler (MSU '46), Elkhart, Ind., secretary-treasurer.

American Association of Equine Practitioners

Approximately 70 veterinarians attended the meeting of the American Association of Equine Practitioners in Detroit, August 21.

Practice tips were given at the meeting by Dr. Howard Dawson (MSU '56), Livonia, Mich. A business meeting and a professional program was held.

The association will elect new officers at its coming meeting in Fort Worth, Texas, December 2-4. Dr. M. B. Teigland (ISU '45), Opa Locka, Fla., is presently president. Dr. Marion L. Scott (OSU '19), Akron, Ohio, is permanent secretary of the association.

Society for the Study of Breeding Soundness of Bulls

The meeting of the Society for the Study of Breeding Soundness of Bulls was held August 21 in Detroit. The program was attended by 45 veterinarians.

A presentation entitled, "Results of Examination of 8,000 Bulls," was presented by Dr. Leslie Ball (COL '56) and Dr. E. J. Carroll (COL '57). Dr. R. A. Gessert (MSU '50) presented a report on "Controlled Estrus in Cattle."

Officers of the society will be elected at its annual meeting in Fort Collins, Colo., Feb. 18, 1962. Present officers are: Drs. H. J. Hill (COL '46), Denver, Colo., chairman; James Bell (COL '59), Logan, Utah, vice-chairman; and E. J. Carroll (COL '57), secretary-treasurer.

Industrial Veterinarians' Association

The seventh annual meeting of the Industrial Veterinarians' Association was held on August 23 in Detroit.

Highlight of the meeting was an address entitled, "Communication Crisis," given by Mr. Joseph Coffman, president of the Tecnifax Corporation at Holyoke, Mass. At the business meeting, the association established a communications committee whose major responsibility will be to publish a quarterly newsletter. Dr. Joe Fell (MSU '47), Morris Plains, N. J., was appointed chairman. Workshop meetings to be held on a regional basis during the coming year, were planned.

Officers elected are: Drs. Alex Zeissig (COR '26), Mountainside, N.J., president-elect; Ross Brown (MSU '46), Princeton, N. J., president; Otto Siegmund (MSU '44), Rahway, N. J., treasurer; and C. W. Darby (MSU '40), St. Louis, Mo., secretary. Executive board members elected are: Drs. A. L. Andrews (CAL '52), Ashland, Ohio; Hardin Gouge (TEX '38), Sedalia, Mo.; and O. L. Thompson (WSU '59), Charles City, Iowa.

Association of American Boards of Examiners in Veterinary Medicine

The Association of American Boards of Examiners in Veterinary Medicine met in Detroit on August 20 and 21. Major business at the meeting was a review of a survey conducted last year to determine a date for conducting national boards in regional areas of the United States. The group reports that there is now a stronger likelihood that states and colleges will be able to agree upon a suitable examination date. There are 30 states that are active members of the association.

Plans were laid at the meeting for busi-

New officers of the Association of American Boards of Examiners in Veterinary Medicine settle down to work. They are (left to right): Drs. Robert R. Shomer, Edward A. Zullo, and William K. Riddell.

ness to be conducted for the coming year. The association's program calls for a study of problems of reciprocity, internship, issuance of temporary permits, and codes of ethics. The Association of American Boards of Examiners in Veterinary Medicine also plans to draft, in the coming year, an ideal practice act for the purpose of attaining minimum standards throughout the country.

Newly elected officers of the association are: Drs. Edward A. Zullo (MID '44), Natick, Mass., president; William K. Riddell (COL '35), Los Angeles, Calif., vice-president; and Robert R. Shomer (UP '34), Teaneck, N.J., secretary-treasurer. Members elected to the association's executive committee are: Drs. Salo Jonas (ONT '30), New Haven, Conn.; and Victor L. Kothman (TEX '40), Mason, Texas.

National Association of Federal Veterinarians

More than 100 members attended the meeting of the National Association of Federal Veterinarians August 21 in Detroit.

At the meeting consideration was given to having two NAFV meetings a year—one in conjunction with the AVMA meeting and the other in conjunction with the meeting of the U. S. Livestock Sanitary Association.

Dr. C. H. Pals (ISU '32), director of the Meat Inspection Division, USDA, and chairman of the NAFV legislative committee, gave a report on legislation now before Congress which might affect federal employees.

Dr. J. E. Wilson (COL '30), Los Angeles, Calif., is president of the association. Dr. F. L. Herchenroeder (STJ '18), Arlington, Va., is secretary-treasurer.

Association of Deans of American Colleges of Veterinary Medicine

The Association of Deans of American Colleges of Veterinary Medicine held its annual meeting in Detroit on August 20.

Subjects discussed at the meeting were school accreditation, careers for veterinarians in USDA, the establishment of a uniform date for state board examinations, veterinary internships, career recruitment, veterinary draft, and the establishment of an Association of American Veterinary Medical Colleges.

Officers re-elected for the coming year are: Drs. E. E. Leasure, School of Veterinary Medicine, Kansas State University, president; W. T. S. Thorp, College of Veterinary Medicine, University of Minnesota, vice-president; and A. H. Groth, School of Veterinary Medicine, University of Missouri, secretary-treasurer.

American Association of Zoo Veterinarians

The meeting of the American Association of Zoo Veterinarians was held on August 21 in Detroit.

Highlight addresses at the meeting were "The Quarantine of Imported Animals and Birds," by Dr. Claude Smith (OSU '35), Hyattsville, Md., USDA; and "The Immobilization of Free Grazing Wild Animals at Africa, U.S.A.," by Dr. James Wright (KSU '11), Roswell, Ga.

Officers elected are: Drs. Charles Gandal (COR '51), Pleasantville, N.Y., president; Weaver Williamson (OSU '54), Hinsdale, Ill., vice-president; and Lester E. Fisher (ISU '43), Berwyn, Ill., secretary-treasurer.

State-Federal Regulatory Veterinarians Conference

The meeting of State and Federal Regulatory Veterinarians was held on August 22 in Detroit. It was co-chaired by Drs. R. J. Anderson (TEX '35), chief, Agricultural Research Service, USDA, and H. G. Geyer (OSU '36), state veterinarian of Ohio.

Four presentations were given at the meeting. They were: "Latest Developments in Hog Cholera and Its Eradication," by Dr. F. J. Mulhern (AUB '45); "Current Status of Control and Testing of Biological Products," by Dr. R. P. Jones (MO' 50); "Laboratory and Field Studies on Tuberculosis Eradication," by Dr. W. L. Mallmann, professor of microbiology and public health at Michigan State University; and "Current Anaplasmosis Situation," by Dr. T. O. Roby (AUB '42).

Animal Disease Eradication Branch, USDA

The meeting of Animal Disease Eradication and Animal Inspection and Quarantine Division veterinarians, USDA, was held August 21 in Detroit.

A panel discussion was held on "What are we doing in our exporting states to prevent diseased livestock from being exported into other states." Panelists were: Drs. Asa Winter (MSU '21), E. J. Wilson (OSU '40), Carl E. Boyd (AUB '43), L. R. Barnes (OSU '35), A. A. Erdmann (OSU '43), and F. L. Herchenroeder (STJ '18).

Other presentations were on the back tagging program, by Dr. Irwin Erickson (ONT '29); what happens when a county is removed from modified, accredited lists, by Dr. A. F. Ranney (COR '32); the status of biological licensing inspection, by Dr. R. P. Jones (MO '50); and current events in the Animal Inspection and Quarantine Division.

Meat Inspection Division, USDA

About 70 veterinary meat hygiene specialists from federal, state, and local regulatory agencies attended the USDA Meat Inspection section meeting at the AVMA convention in Detroit.

In a program designed to inform these specialists of the latest developments in the meat processing field, speakers dealt with bacteriologic controls, chemical residues, new federal regulatory controls for smoked meats, and federal meat inspection performed for various agencies of the federal government. Dr. P. J. Brandly (KSU '33), chief staff officer for biological control in the federal Meat Inspection Division, discussed meat inspection responsibility in bacteriological controls for frozen foods; Dr. K. E. Taylor (KSU '46), assistant staff officer for procedures and training, told of new concepts in residue controls and their effect on meat inspection routines.

Dr. S. J. Berger (COR '32), assistant director for the division, reported on cured and smoked meat processing under new federal control procedures; and Dr. H. H. Pas (ISU '27) told of the division's role in specification on examination of products for government agencies.

Dr. R. K. Somers (MSU '36), associate director of the federal Meat Inspection Division, was chairman for the division's section meeting.

National Veterinary Wholesalers Association, Inc.

Officers elected at the meeting of the National Veterinary Wholesalers Association, Inc., August 21 in Detroit are: Mr. C. Guy Stephenson, Goshen, N. Y., president; Mr. Oliver W. Nelson, Sioux Falls, S. Dak., vice-president; and Mr. Harvey Gibson, Palisades Park, N. J., secretary-treasurer.

Army Veterinary Corps

Officers of the Army Veterinary Corps met in Detroit on August 22.

Approximately 50 attended the meeting, which was moderated by Brig. Gen. Russell McNellis (ISU '28), chief of the Army Veterinary Corps. General McNellis explained the impact of the proposed increase in the Military Forces and its effect on the Corps. He also spoke on inspection and personnel problems.

Other speakers included: Col. Wayne D. Shipley (COL '35), deputy assistant for veterinary services, Washington, D.C., who spoke on training of veterinary corps officers; Col. Nels Christensen (ISU '33), commandant, U. S. Army Medical Service

Meat and Dairy Hygiene School, Chicago, Ill., who explained the courses available at the school; Lt. Col. W. J. Schneider (COL '44), Combat Development Command, Fort Sam Houston, Texas, who commented on recent and proposed combat developments and their effect on the Army Veterinary Corps; and Lt. Col. R. B. Morgan (ISU '43), Medical Field Service School, Fort Sam Houston, Texas, who related information relative to training offered at that school.

Iowa Veterinarians—Pharmacists Sign Code of Understanding

The Iowa V.M.A. and the Iowa Pharmaceutical Association have announced the adoption of a Code of Understanding between Doctors of Veterinary Medicine and Pharmacists.

The preamble of the code states that its purpose is to improve relations between doctors of veterinary medicine and pharmacists . . . that the public will be better served. It says the code is not a pronouncement of law. It suggests rules of conduct for the members of these two professions subject to the principles of ethics and practice governing the members of the respective organizations.

Some major points in the code are:

Pharmacists

- "The pharmacist shall not diagnose, prognose, treat, administer to, or operate on farm animals, but should refer those requesting such assistance to a doctor of veterinary medicine providing for freedom of choice.
- "The sale of veterinary proprietary products that have been released by the Federal Food and Drug Administration for over-the-counter sale which is requested through self diagnosis by the individual requesting the product, shall not be considered counter prescribing by the pharmacist. Nor shall it be construed as violating the practice of veterinary medicine when it is the responsibility of the pharmacist to advise the purchaser of a veterinary proprietary as to counter-indications, cautions, dosage and instructions for administration.
- "The selling of veterinary products labeled with the federal Rx legend; 'Caution: Federal law restricts this drug to sale by or on the order of a licensed veterinarian, or on his prescription or order,' is prohibited by federal law and as such a pharmacist is legally and ethically bound to adhere to the law.
- "The repackaging of veterinary products for over-the-counter selling, if such product can legally be sold for veterinary use without a prescription, is a given right of a pharmacist. The prepackaged product must bear adequate directions for safe and effective use and warning against misuse that may be needed by a layman as provided by federal law.
- "The pharmacist shall provide an adequate supply of veterinary products, including biologicals, which the doctor of veterinary medicine may obtain either through direct purchase or by prescription for the treatment of animals. He shall serve as a source of information on new drugs in order that the farm and city community may have advantage of the latest pharmaceutical developments.
- "The selling of veterinary pharmaceuticals at a discount or cut price, is not considered as being in the best interest of either profession in that it tends to discount the professional service rendered."

Veterinarians

- "The veterinarian should recognize the specialized training of the pharmacist, and utilize his service whenever they serve the best interest of the farm and city community.
- "Merchandising indiscriminately of veterinary products by the veterinarian should not occur. The (AVMA) Code of Ethics states "dispensing by the veterinarian is interpreted to mean providing veterinary products for lay use, only on the supposition that the veterinarian has had previous knowledge of the particular case or general conditions which apply to the scientific farm or kennel.
- "A veterinarian should not advise a client about the cost of various pharmaceuticals or biologics any more than a pharmacist should advise him about the cost of veterinary services."

The Code of Understanding was developed after a series of meetings between the Iowa V.M.A.'s Pharmacy Committee and the Iowa Pharmaceutical Association's Animal Health Committee.

House Reference Committees at Detroit

Every year immediately preceding the scientific session of the Annual Meeting, the business sessions of the AVMA are conducted. Resolutions, proposals, special reports, and other matters concerning the profession are reviewed by the Executive Board, the governing body of the AVMA, which then offers recommendations. These matters are then reviewed by the House Advisory Committee which considers and evaluates the Executive Board decisions and makes its own recommendations. This committee then refers these matters to house reference committees for detailed analysis.

There are seven house reference committees, the chairman of each being a member of the House Advisory Committee. Other members of each house reference committee are appointed by the president-elect so that there are five members in each committee, each of whom is also a delegate or alternate delegate in the House of Delegates.

According to the AVMA Constitution and Bylaws, each house reference committee shall consider the matters referred to it, make recommendations, and report to the House when called upon by the presiding officer. Officers, members of councils, special committees, other house reference committees, or employees of the Association may be called upon by any committee for such information as may be needed to formulate conclusions and recommendations. Each house reference committee shall file a report setting forth its recommendations to the House of Delegates.

Although the arrangement for conducting the Association's business seems cumbersome at first glance, it does permit critical evaluation by several groups independently.

Committee on reports of officers: Reports of the Executive Board and officers are referred to this committee. Left to right: Drs. Moe (Okla.), Candlin (Colo.), Bjork (Ore.), Pieper (Conn.), Kingman (AVMA staff), Madden (Ohio), Luckett (Ky.).

Committee on legislation: Matters relating to state and national legislation, to memorials to legislative bodies, the U.S. Congress, and the President of the United States are referred to this committee: Left to right: Drs. McCallam (AVMA staff), Roy (Fla.), Cook (Tenn.), Lassen (Ariz.), Stauffer (Colo.), Jones (Ore.), Thomas (Ark.).

Committee on public relations and veterinary service: Matters pertaining to public relations and veterinary service are studied by this committee. Left to right: Drs. Kelley (Wis.), Monroe (Ala.), Coombs (Maine), Booth (Ind.), Humphreys (Wyo.).

Committee on internal affairs: All proposed amendments to the Constitution and By-Laws, Principles of Veterinary Medical Ethics, and membership are handled by this committee. Left to right: Drs. Carricaburu (Calif.), Van Houweling (D.C.), Twiehaus (Kan.), Oglesby (La.), Hodges (N.Y.), Spencer (Mo.).

Committee on veterinary education and research: Matters pertaining to education and research are analyzed by this committee. Left to right: Drs. Crawford (Miss.), Snyder (Pa.), Misener (Ill.), Leasure (AVMA president), Hay (AVMA staff), Schneider (Idaho), Saunders (Texas).

Miscellaneous matters. Special matters about which the House of Delegates may need advice are referred to this committee. Left to right: Drs. McCoy (N. J.), Roberts (Ohio), Meyer (W. Va.), Gomez (Puerto Rico), Lee (Iowa), Griffith (Wash.), McNellis (Army), West (Minn.), Freeman (AVMA staff).

This system also allows a fairly thorough analysis in a short period of time. Time is an important factor because most of those conducting AVMA business hold full-time positions in pursuit of their livelihoods and have an opportunity to meet only once or twice each year. All committees have assigned to them an AVMA staff consultant and two representatives from the Executive Board. Any member of the House of Delegates not specifically assigned may attend any reference committee meeting he chooses.

Committee on veterinary military affairs and civil defense (photo not available). All matters relating to military and civilian defense are considered by this committee. Assigned members: Drs. Miller (Air Force), Herchenroeder (NAFV), Von Gremp (Ga.), Peck (Neb.), Hines (N. Car.).

AVMA Renews Pledge of Cooperation with NAAB

Dr. Harold J. Hill (COL '46), a previous (1961) member of AVMA's Council on Veterinary Service, served as AVMA representative at the meeting of the National Association of Artificial Breeders in Syracuse, N.Y., Aug. 23, 1961, and renewed AVMA's pledge of cooperation with the group.

Here are some excerpts from Dr. Hill's address:

"During the past years there have been a number of stimuli which have directed the thoughts of veterinarians and animal husbandmen toward the current status of knowledge and practices relative to those transmissible diseases, particularly of cattle, which have special implication in artificial insemination. Among such stimuli have been reports of newer diseases such as epizootic bovine abortion, catarrhal vaginitis of cattle, presently thought to be of viral origin, and contagious epididymitis and vaginitis of cattle reported in foreign literature. Another stimulus has been the insidious increase in tuberculosis in the cattle herds of our country and the implication that perhaps we are becoming lulled into believing that this disease needs only cursory control now. Two scientific papers presented at our current convention point out the possible danger of our livestock population being invaded by a host of diseases formerly native to foreign lands but now only a few hours away by fast flying jet.

"Closely associated with these lingering threats to our very livelihood is continual improvement in the efficiency of organized bull studs, which now makes it possible for a single bull to have from a few thousand to more than 50,000 opportunities to transmit diseases to females located in thousands of herds scattered over the country.

"For these reasons the Council on Veterinary Service of the AVMA elected to review the 'Minimum Standards for Health of Bulls in Artificial Insemination,' which was last approved and accepted by both the AVMA and the NAAB in 1954. Careful analysis of the results of the survey con-

ducted by the NAAB Sire Health and Management Committee in 1959 would indicate that, as a whole, the organized A.I. industry was living within the aforementioned Standards but it also pointed out that there could be more vigorous and all exclusive efforts exerted toward the defense against transmissible disease. Although the proved incidence of single cow or herd infection due to semen obtained from bulls housed in NAAB member studs has been low over the past quarter of a century, this does not detract from the tremendous potential threat existing within our national livestock population.

"Considerable time was devoted to discussion of the various diseases of cattle which are directly or indirectly associated with bulls and to semen from bulls used in A.I. service. The Committee was charged with constructing such a minimum set of standards as to be realistic and meaningful in the light of present day knowledge about the respective diseases and yet be workable and practical under almost any management or financial situation. Of chief concern were the diagnostic tests which are currently in vogue or which are being proposed by various research groups. The Committee restricted its final draft of the Standards to those diagnostic procedures and techniques which have been well established through the years. In fact, no real positive change in diagnostic procedures or disease control has been established as 'the answer' to such diseases as vibriosis or leptospirosis since the original Standard was prepared.

"After thorough review of the previously written Minimum Standards, the AVMA Committee on Sire Health and Management hoped to be able to assist the NAAB in certification of their member businesses. However, it was the ruling of the policy-making House of Delegates, convening in Detroit, that it is contrary to AVMA policy to endorse the activities of businesses or organizations outside of its immediate membership.

"We therefore propose that the NAAB renew their intent by resolution to accept the revised 'Code of Minimum Standards for Health of Bulls and Hygiene of Bull Studs Producing Semen for Artificial Insemination' as the official standard of the industry and that the NAAB endow their Committee on Sire Health and Management with explicit authority to establish that each of its member organizations comply with its intent.

"We would suggest that a document uniquely designed and of a quality commensurate with the dignity of your profession, be prepared which will indicate to all concerned that the recipient has performed the recommended tests and procedures as set forth in the 'Code' and that such member organization carries the approval of the NAAB Sire Health and Management Committee for a stipulated period of time.

"The AVMA urges that you join us in an effort to make the principle and the contents of the 'Code' available to organizations or individuals outside of your membership who are engaged in any phase of the science of artificial insemination and to impress upon such businesses the need for compliance; for often it is one rotten apple which ultimately destroys the whole barrel. A combined AVMA-NAAB effort should be made to reach the people engaged in the actual practice of A.I. through such organizations as the Dairy Breed Associations, the Beef Breed Associations, the American National Cattlemen's Association, the Director of Clinic of each of the veterinary colleges, the deans of the veterinary and agricultural colleges, Livestock Conservation Inc., and the National Livestock Sanitary Association.

"The explosive growth of A.I. of range beef cattle in those areas of the United States where large cattle ranches exist but where relatively few experienced inseminators reside has created new problems. The restricted breeding season practiced in the beef cattle industry and the extensive distances between ranches imposes a demand for many trained men during a relatively short period of the year. Such a situation has stimulated several groups of individuals to establish schools of instruction, offering courses extending from four to ten days, and advertised as preparing the students for work in all phases of artificial insemination extending from collection and processing of frozen or chilled semen to pregnancy examination.

"Since many of these 'free-lance' technicians will be functioning as servicemen outside of any member organization it is suggested by the AVMA Committee on Allied Organizations that the NAAB consider establishing a well designed, 'Recommended Standard Curriculum' for such privately conducted schools.

"It would also be of great value to potential NAAB members among the many beef breeders of the country to be able to employ

artificial insemination technicians who have satisfied certain requirements set forth by NAAB relative to specialized training in this field, wheresoever he might have received such training. Again the AVMA Council on Veterinary Service offers its cooperation in an advisory capacity and will provide all assistance possible.

"After careful deliberation, it was concluded that the above recommendations would provide a satisfactory method whereby sire health and management would be voluntarily controlled by your industry, with the unqualified assistance of the AVMA, in such a manner that the respective positions of both the AVMA and NAAB would be strongest and most influential."

Hog Cholera Eradication Bill Becomes Law

PUBLIC LAW 87-209, 87TH CONGRESS, S. 1908, SEPTEMBER 6, 1961. AN ACT TO PROVIDE FOR A NATIONAL HOG CHOLERA ERADICATION PROGRAM.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that, in order to safeguard the health of the swine herds of the nation, to prevent the spread of hog cholera, to decrease substantially the estimated $50,000,000 annual loss from hog cholera, to expand export markets for pork and pork products now restricted on account of hog cholera, and to otherwise protect the public interest, the Secretary of Agriculture is hereby directed (1) to initiate a national hog cholera eradication program in cooperation with the several states under the provisions of section 11 of the Act of May 29, 1884, as amended (21 U.S.C. 114a), and related legislation, and (2) to prohibit or restrict, pursuant to the authority vested in him under the provisions of section 2 of the Act of February 2, 1903, as amended (21 U.S.C. 111), the interstate movement of virulent hog cholera virus or other hog cholera virus to the extent he determines necessary in order to effectuate such eradication program.

Sec. 2. (*a*) The Secretary of Agriculture is authorized and directed to establish an advisory committee composed of (1) 11 members selected from representatives of the swine and related industries, state and local government agencies, professional and scientific groups, and the general public, and (2) one member selected from the officers and employees of the Department of Agriculture who shall serve as chairman of the committee. The committee shall meet at the call of the Secretary.

b) It shall be the function of the committee to advise the Secretary with respect to the initiation of the national hog cholera eradication program referred to in the first section of this Act, and with respect to the development of plans and procedures for carrying out such program.

c) Committee members other than the chairman shall not be deemed to be employees of the United States and shall not be entitled to compensation, but the Secretary is authorized to pay their travel and subsistence expenses (or per diem in lieu thereof) in connection with their attendance at meetings of the committee.

AVMA Resolution Entered in Congressional Record

A resolution adopted at the recent AVMA convention in Detroit commending Senator Hubert Humphrey (D., Minn.) and the members of the Senate Subcommittee on Reorganization and International Organizations for their efforts on behalf of the veterinary profession appeared in the *Congressional Record—Senate* on Sept. 8, 1961.

It was entered by Senator Humphrey who said he was pleased to report that the print "Veterinary Medical Science and Human Health," has met with an outstanding reaction from the scientific community.

The resolution states:

"Whereas many activities and programs of veterinary medicine contribute directly to the maintenance and improvement of human health and well-being; and

"Whereas the role of veterinary medicine in the total national health picture becomes increasingly significant as the rapid growth of our population countinues; and

"Whereas many important biomedical discoveries affecting man have had, and are having, their origin in veterinary medical research; and

"Whereas increased veterinary medical research is needed to speed solutions to

cancer, heart disease, and other problems common to man and animal; and

"Whereas the success of America's man-in-space experiments hinges in considerable part on the findings of animal-in-space experiments; and

"Whereas these aspects of veterinary medicine have been forcefully and comprehensively stated in a 244-page report, entitled "Veterinary Medical Science and Human Health," prepared by a Senate Government Operations Subcommittee of which Senator Hubert H. Humphrey, Democrat of Minnesota, is chairman: Therefore be it

"Resolved, that the American Veterinary Medical Association, in convention assembled, commend Senator Humphrey and all members of the Subcommittee on Reorganization and International Organizations for their excellent presentation of the need for long-range, well-funded and coordinated Federal-State research efforts cross-seeding the biomedical research findings in both human and veterinary medicine; and be it further

"Resolved, that a copy of this resolution be forwarded to the chairman and members of both the Committee on Government Operations of the U.S. Senate and its Subcommittee on Reorganization and International Organizations."

Dr. Aurelio Malaga Alba, veterinary public health advisor, Pan American Health Organization, Mexico City, receives citation from Dr. Ernest S. Tierkel, past-president of the Conference of Public Health Veterinarians.

Latin American Veterinarians Honored

Dr. Aurelio Malaga Alba and Dr. Fernando Camargo, both of Mexico City, were given awards for outstanding achievement at the annual meeting of the United States-Mexico Border Public Health Association.

The awards were made by Dr. Ernest S. Tierkel (UP '42) on behalf of the membership of the Conference of Public Health Veterinarians.

Dr. Malaga Alba, a native of Peru, was founder and first dean of the National School of Veterinary Science, Lima, an outgrowth of the Military College of Veterinary Science. He also served as director of the Veterinary Hospital and chief of the Veterinary Laboratory of the Peruvian Army. In 1949, he was appointed director general for livestock in the Peruvian Department of Agriculture. Since 1950, Dr. Malaga Alba has been a staff member of the Pan American Health Organization and is presently chief veterinary public health advisor at PAHO's Zone II Office in Mexico City. He has been responsible for improving animal disease control and veterinary public health programs in many Latin American countries and is best known for his extensive investigations and control activities in rabies.

Dr. Fernando Camargo was presented his award in absentia. Dr. Camargo is best known for his work as director, Mexican Institute of Livestock Disease Investigations at Palo Alto. He has occupied important positions in the Mexican Departments of Public Health and Agriculture. He was dean and professor of virology at the School of Veterinary Medicine, University of Mexico. He has been responsible for large scale production of veterinary biological products, particularly rabies and foot and mouth disease vaccines, and for the operation of disease control programs in the areas of the United States-Mexico border.

Veterinary Draft Foreseen

Because of the tense international situation, the strength of the military forces is being materially increased. As a result, the officer strength of the Army Veterinary

Corps will likewise be increased at an early date. Probably 75 additional officers will be required.

Unless a sufficient number of voluntary applications from veterinarians for commission and active duty (in the grade of 1st Lt. only) is received, veterinarians will be drafted into the Army Veterinary Corps under the provisions of the Universal Military Training and Service Act (doctor draft). Plans are being made to induct the first group in the fall of 1961 and subsequent groups may be drafted to start their duty in January and April, 1962.

It is understood that veterinarians under 26 years of age whose work is considered to be least essential to the livestock industry and the welfare of the nation will be called first. The exact number of veterinarians to be drafted will depend, in part, on the number who volunteer for commissions and active duty in the immediate future.

Veterinarians who desire to make voluntary application for appointment and active duty in the Army Veterinary Corps should write to the Army Area Headquarters closest to them in care of AMEDS Personnel Counselor Surgeons Office, requesting the necessary application forms and instructions. Correct address of an Army Area Headquarters may be obtained from almost any military office or post office.

The Air Force Veterinary Service is still accepting voluntary applications from veterinarians for two years' active duty for an expected expansion in that service. Applications should be made to Medical Procurement Branch, AFCSG 25.1, Office Surgeon General, Headquarters, U.S. Air Force, Washington 25, D.C.

Washington State Announces Two Veterinary Faculty Changes

Two faculty changes have recently been announced by the Washington State University College of Veterinary Medicine.

Dr. Ghery D. Pettit (CAL '53) has accepted a position as assistant professor in the Department of Clinical Medicine and Surgery effective this fall.

Following his graduation in 1953, Dr. Pettit accepted an appointment on the faculty of the College of Veterinary Medicine at the University of California and held this position until spring of 1961. He replaces Dr. Clifford Eby (KSU '50) who resigned last spring to accept a position with the New York Humane Society.

Dr. Robert W. Compton (WSU '59) has accepted an appointment as instructor in the Department of Veterinary Anatomy in the College of Veterinary Medicine beginning this fall.

Since his graduation from the College of Veterinary Medicine, Dr. Compton has been in practice in Alberta, Canada. He replaces Dr. Fred Smith who resigned last spring to accept a postdoctoral fellowship at the University of Wisconsin where he plans to continue his education for the next three years.

Feed Additive Case Points Up Need for Care

The Food and Drug Administration announced it is taking action to seize a medicated feed which caused the deaths of more than 700 turkeys on Massachusetts farms last month.

At the same time a criminal prosecution is being filed against the feed manufacturer on five counts of shipping adulterated and mislabeled animal and poultry feeds that contained excessive quantities of potent drugs and drugs not listed on the labels. The feed firm involved was advised to immediately stop further distribution of medicated feed until it can insure through proper analysis and controls that such feeds contain the proper amount of any drug used in them.

The firm is the Elmore Milling Co., Oneonta, N.Y. The government charged that the firm's "Chix Saver" feed contains approximately 180% of the represented amount of sulfaquinoxaline and approximately 209% of the represented amount of arsanilic acid, drugs used for treating poultry diseases and stimulating growth.

Cornell Receives Grant for Parasitic Disease Study

A three-year grant of $114,900 has been awarded to the New York State Veterinary College, Cornell University, by the National

Science Foundation, Division of Biological and Medical Sciences, for a broad study of a natural parasitic disease primarily occurring in sheep.

Dr. John H. Whitlock (ISU '34), professor of parasitology, was the recipient of the grant. Previous investigations conducted by Dr. Whitlock have demonstrated that the occurrence of trichostrongylidosis in sheep is not by chance alone; that serious disease is the result of reactions between the host animal's hereditary character, and various environmental factors.

"These reactions can be measured rather accurately," he explained, "and therefore the over-all model presented by the disease can be taken apart to trace the active biological processes which determine the survival or death of the host animal."

The actual research, which will combine the efforts of representatives of the fields of biostatistics, ecology, physical biology, genetics, biochemistry, and parasitology, will be carried out partly by graduate assistants.

Dr. E. E. Wedman To Head Diagnostic Laboratory at NADL

Dr. E. E. Wedman (KSU '45) has been appointed chief veterinarian, Diagnostic Laboratories, National Animal Disease Laboratory, Ames, Iowa. He was formerly veterinarian, Laboratory Services staff, Washington, D.C.

Dr. E. E. Wedman

In 1956 Dr. Wedman received a MPH degree from the University of Minnesota. From 1945 to 1947 he was in general practice in Kingman, Kan., and during the foot and mouth disease campaign in Mexico, he performed duties at the Tacuba Laboratory, Mexico City. He returned to general practice in 1948. In 1950 he was with the Army Veterinary Corps as station veterinarian. Upon discharge from the Army in 1952 he re-entered federal service and was appointed veterinarian in charge, Wichita Union Stockyards, Wichita, Kan., where he remained until 1954 when he transferred to St. Paul, Minn. He remained in this position until 1958 when he joined the Laboratory Services staff, ADE, Washington, D.C., in which capacity he served until his transfer to the National Animal Disease Laboratory, Ames, Iowa.

Dr. Wedman is a member of the AVMA, the National Association of Federal Veterinarians, the American Association of Veterinary Bacteriologists, the Conference of Veterinary Laboratory Diagnosticians, and the U. S. Livestock Sanitary Association.

Dr. C. F. Diehl Transferred

Dr. Chester F. Diehl (UP '36) has recently been transferred to the position of inspector in charge of the Philadelphia, Pa., station of the Meat Inspection Division. He succeeds Dr. M. W. Cohen (CVC '18) whose retirement became effective Aug. 19, 1961, after more than 41 years of service.

Dr. C. F. Diehl

Dr. Diehl went to his new post from Newark, N.J., where he had been inspector in charge since 1959. He entered meat inspection as a junior veterinarian at Boston in 1936 and has held supervisory positions at various locations in the United States.

Dr. E. W. Jenney Transfers to Ames

Dr. Edwin W. Jenney (WSU '43) has been transferred to Ames, Iowa, where he will work in veterinary virology at the USDA National Animal Disease Laboratory.

Dr. E. W. Jenney

Dr. Jenney entered federal service in 1943 in the state of Washington with the former Bureau of Animal Industry, and performed field activities in the eradication of tuberculosis and brucellosis. He transferred to the Pathological Division, Animal Disease Station, Beltsville, Md., in 1949, where he did research work with vesicular diseases. In 1956 he was put

in charge of the Vesicular Disease Diagnostic Laboratory, Diagnostic Services, Animal Disease Eradication Division at Beltsville, and he transferred to Ames, Iowa, at the time the laboratory was moved there.

Dr. Glenn B. Van Ness Transfers to Ames

Dr. Glenn B. Van Ness (KSU '40) has been transferred to Ames, Iowa, to work in veterinary epidemiology at the National Animal Disease Laboratory.

Dr. G. B. Van Ness

Dr. Van Ness entered federal service with the former Bureau of Animal Industry in 1940 as junior veterinarian in Little Rock, Ark., performing duties in the field and laboratory on brucellosis. He transferred to Columbia, Mo., in the same capacity in 1941, and in 1943 to the Western Washington Experiment Station, Puyallup, Wash., as assistant veterinarian, Poultry Diseases. In February, 1945, he joined the University of Arkansas, Fayetteville, as an instructor in veterinary science and in 1946 he joined the University of Florida, Gainesville, as associate poultry pathologist. In 1953 he re-entered federal service with the Animal Disease and Parasite Research Division, Beltsville, Md., working on anthrax and leptospirosis.

Dr. Van Ness received an ARS Meritorious Service Award in 1958. He is a member of the AVMA, the National Association of Federal Veterinarians, the Soil Conservation Society of America, the American Association for the Advancement of Science, and the District of Columbia V.M.A.

Dr. L. G. Morehouse to Work in Pathology at Ames

Dr. Lawrence G. Morehouse (KSU '52) has been named as veterinarian (pathology), National Animal Disease Laboratory, Ames, Iowa.

Dr. L. G. Morehouse

Dr. Morehouse was engaged in small animal practice in Kirkwood, Mo., from May, 1952, until February, 1953, at which time he entered federal service with the Animal Disease Eradication Division, Purdue University. He received his M.S. degree in veterinary pathology from Purdue in January, 1956, and a Ph.D. degree in animal pathology in June, 1960. His research work was in the field of virology. In July, 1960, he was transferred to the staff of the Laboratory Services, Washington, D.C., in which capacity he remained until his transfer to Ames, Iowa.

Dr. Morehouse was the recipient of a USDA Outstanding Performance Certificate of Merit in 1959.

Deaths

Star indicates member of AVMA

E. J. Arbaugh, 87, of Ozark, Ark., died July 18, 1961.

L. F. Bacon (KCV '18), 77, Waterloo, Iowa, died May 23, 1961.

Dr. Bacon practiced in Cedar Falls, Iowa, for 27 years. He then became chief sanitary inspector in Waterloo until his retirement.

Alfred L. Bailey (KCV '04), 82, Kansas City, Mo., died Aug. 18, 1961.

Dr. Bailey had been employed by the Federal Bureau of Animal Industry and the Kansas City Health Department.

R. E. Boxmeyer (KCV '13), 71, Overland Park, Kan., died of a heart attack Aug. 14, 1961.

Dr. Boxmeyer was with Jensen-Salsbery Laboratories for 20 years and was a founder and vice-president of Private Brands, Inc., Kansas City, Kan.

Lawrence G. Breniser (CIN '16), 66, Bellefontaine, Ohio, died Aug. 8, 1961.

Dr. Breniser was a general practitioner for 45 years in Bellefontaine.

Fred E. Brown (MCK '10), 79, Humboldt, Iowa, died May 3, 1961.

Dr. Brown practiced in Blandinsville, Ill., for 32 years and then set up a small animal hospital at Emporia, Kan. Later he moved to Humboldt. He retired in 1957.

Kenneth E. Buffin (GWU '16), 73, Silver Spring, Md., died Aug. 10, 1961, of a heart condition.

Dr. Buffin served 28 years as an officer in the Army Veterinary Corps and retired in January, 1946.

Cyril H. Burdette (KCV '11), 72, Centralia, Kan., died Feb. 15, 1961.

Dr. Burdette was a general practitioner.

★**John H. Byerley** (IND '17), 70, Atlanta, Ga., died Aug. 8, 1961.

Dr. Byerley was inspector-in-charge at the Reelfoot Packing Co., in Union City, Tenn., from 1924 to 1934. Prior to that he held similar posts in Des Moines, Iowa, and Nashville, Tenn. From 1934 to 1960 when he retired he was inspector-in-charge for Atlanta and north Georgia.

★**Stanley R. Enoe** (ISU '43), 62, Elgin, Ill., died Aug. 4, 1961.

Dr. Enoe was a small animal practitioner.

Christian C. Ettling (KCV '08), 74, Grover City, Calif., died May 25, 1961.

Dr. Ettling was a federal meat inspector. He retired in 1945.

Frank A. Jelen (KCV '17), 66, Omaha, Neb., died April 2, 1961.

Dr. Jelen operated the Master Laboratory and the Jelen Veterinary Supply Corp., in Omaha. He was formerly state veterinarian.

Henry Jurgess (GR '13), 70, Harbor Beach, Mich., died Aug. 20, 1961.

Dr. Jurgess was a general practitioner.

Alfred J. Lamberson (ONT '91), 91, Whitehall, Wis., died July 21, 1961.

After graduation Dr. Lamberson was employed by the Minnesota State Board of Health for two years before he set up his own practice in Winona, Minn., which he conducted for 10 years before moving to Whitehall.

Samuel W. Lens (UP '13), 69, Philadelphia, Pa., died Aug. 18, 1961.

Albert E. Merry (COR '06), Syracuse, N.Y., died July 5, 1961.

Dr. Merry, former director of the County Department of Animal Disease Control, had maintained a small animal hospital in Syracuse for many years. He had previously practiced in New York City.

Harold P. Miller (ISU '56), 29, Ravenna, Neb., died in a swimming accident June 22, 1961.

Dr. Miller had previously practiced in Blair, Neb. He had served in the Veterinary Corps of the U.S. Army.

H. L. Morrison (ISU '31), 55, Long Beach, Calif., died May 17, 1961.

Dr. Morrison, a general practitioner, had moved from Oskaloosa, Iowa, to Long Beach about 6 years ago.

John W. Page (OSU '17), 65, Andover, Ohio, died June 14, 1961.

Dr. Page had practiced in Madison and Andover, Ohio. He was in the Veterinary Corps of the U.S. Army during World War I.

Frank Pierce (OSU '08), 79, Wilmette, Ill., died July 12, 1961.

Dr. Pierce had maintained a practice in Wilmette for 26 years.

Women's Auxiliary

Potpourri of Convention Happenings

Dr. Dan Anderson, president-elect of the AVMA, perhaps best voiced the sentiments of the majority of veterinarians and their wives when he said at his installation, "Veterinary medicine is my livelihood and my life, and in my love for it, I yield to no man."

• • •

Major strides toward the progress of the profession were taken by the House of Delegates of the Women's Auxiliary when delegates voted to strive for a goal of $100,000 in the 1962 Research Fund campaign and to make available $16,000 for loans to veterinary students.

• • •

Newest addition to the Auxiliary Executive Board is Mrs. B. S. Pomeroy of St. Paul, Minn., who was installed as vice-president for student auxiliaries. Her husband is a member of the faculty of the veterinary school at the University of Minnesota.

• • •

Entertainment at the women's luncheon at the Statler Hilton was provided by two models from a charm school who instructed Auxiliary members and guests on how to get in and out of cars gracefully, how to put on wraps with or without the assistance of an escort, and the proper way to carry handbags.

• • •

Bouquets should be given to all of the members of the AVMA staff and the local committees through whose efforts the 98th annual meeting of the AVMA and the 44th meeting of the Women's Auxiliary progressed so efficiently and pleasantly.

s/Nannette Simpson
Vice-President for Publications

Student Auxiliary Delegates Tell Convention Impressions

Upon considering the venture of attending the AVMA convention, my thoughts were threefold: anticipation, hope, and some reserved concern. I had anticipation of the journey, hope for pleasant experiences and an understanding of the programming and procedures, and concern for the role I would play.

The reservations and preparations made for the delegates were more than any of us had anticipated both at the pre-convention activities at Michigan State University and in Detroit. Besides being enjoyable, my experiences were very informative and will be an aid to our work here at Washington State University.

The efficiency of programming and procedure was very impressive and one could not help but feel very proud to be connected with such an organization.

Attending the convention as a student auxiliary delegate was a most enlightening and enriching experience.

s/Mrs. Zane W. Roth, *student delegate*
Washington State University

Personalities, activities, places—these aspects of the convention had many meanings for me.

My impressions paint a picture of the AVMA convention as the last hour of work in the day of a giant. Here is the endpoint of many tasks that have been worked over long and earnestly. Here is the form into which the next day's work will grow. Here stands the reckoning of all that has been done, whether wanting or surpassing the goal.

My impressions paint a giant in which the best of us are small, and the smallest serve well—a united strength for the good of the veterinary profession.

s/Mrs. Robert L. Westbrook, *student delegate*
Cornell University

This year Michigan State University hosted pre-convention activities for student delegates and student auxiliary members. As president of the Michigan State Auxiliary, I was able to learn much about other student auxiliaries. I was most grateful for the opportunity. It was also my privilege to serve as a delegate to the student auxiliary meeting Sunday night at the Sheraton-Cadillac Hotel.

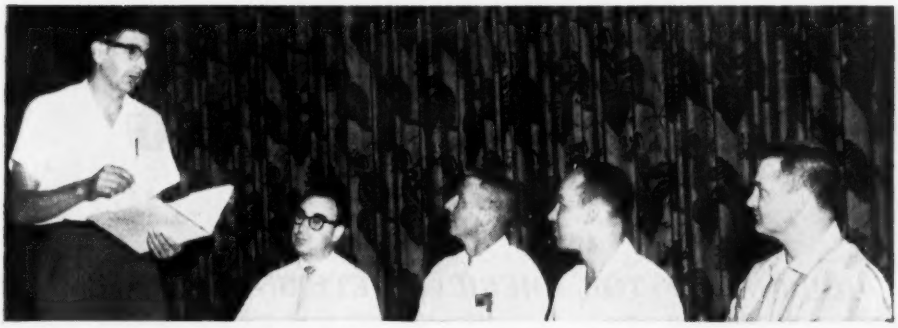
s/Mrs. George Ferguson, *student delegate*
Michigan State University

HOW YOUR PFIZER MAN KEEPS UP-TO-DATE . . . .

A few weeks ago, your Pfizer man attended a week-long meeting at the Edgewater Beach Hotel in Chicago, Illinois. It was an intensive, shirt-sleeve session of give-and-take between Pfizer's veterinary research team and your representative.

He studied and discussed new developments in disease-fighting materials . . . livestock and poultry problems . . . college trials . . . improved methods in disease control. As a result, your Pfizer man keeps up-to-date, in order to serve you better.

Panel discussions on new developments and improved disease prevention methods were held with veterinarians and scientists. Seated, l. to r. are: Warren Reynolds Manager of Pfizer's Agricultural and Research Development Department; Dr. J. E. Fahey, Research Coordinator for the Dept. of Veterinary Medicine; Dr. E. B. Patterson, scientist at AGRAD; Drs. Simon J. Kalish and Hilmer L. Jones, Associate Director and Director of the Dept. of Veterinary Medicine; Dr. W. D. Crawford and Robert Wornick, scientists at AGRAD; and Drs. Blake W. Blakewood and Raymond Fields, Directors of Pfizer's Diagnostic Laboratories.



Veterinarians on the Pfizer staff listen to a report by Dr. J. E. Fahey on research progress at Pfizer's Medical Research Laboratories at Groton, Conn. Seated, l. to r. are: Drs. Simon J. Kalish, Hilmer L. Jones, Blake W. Blakewood and Raymond Fields.

High scholarship winners were congratulated and awarded prizes by Hugh O. Dermody, Assistant General Manager. They are, l. to r.: Garth McDermott, Illinois Representative; Ed Budd, North Carolina; Rudy Lawrence, California; Hilton Terry, Idaho; and Jerry Pitts.

Here they are—all the Pfizer representatives. Can you find yours?

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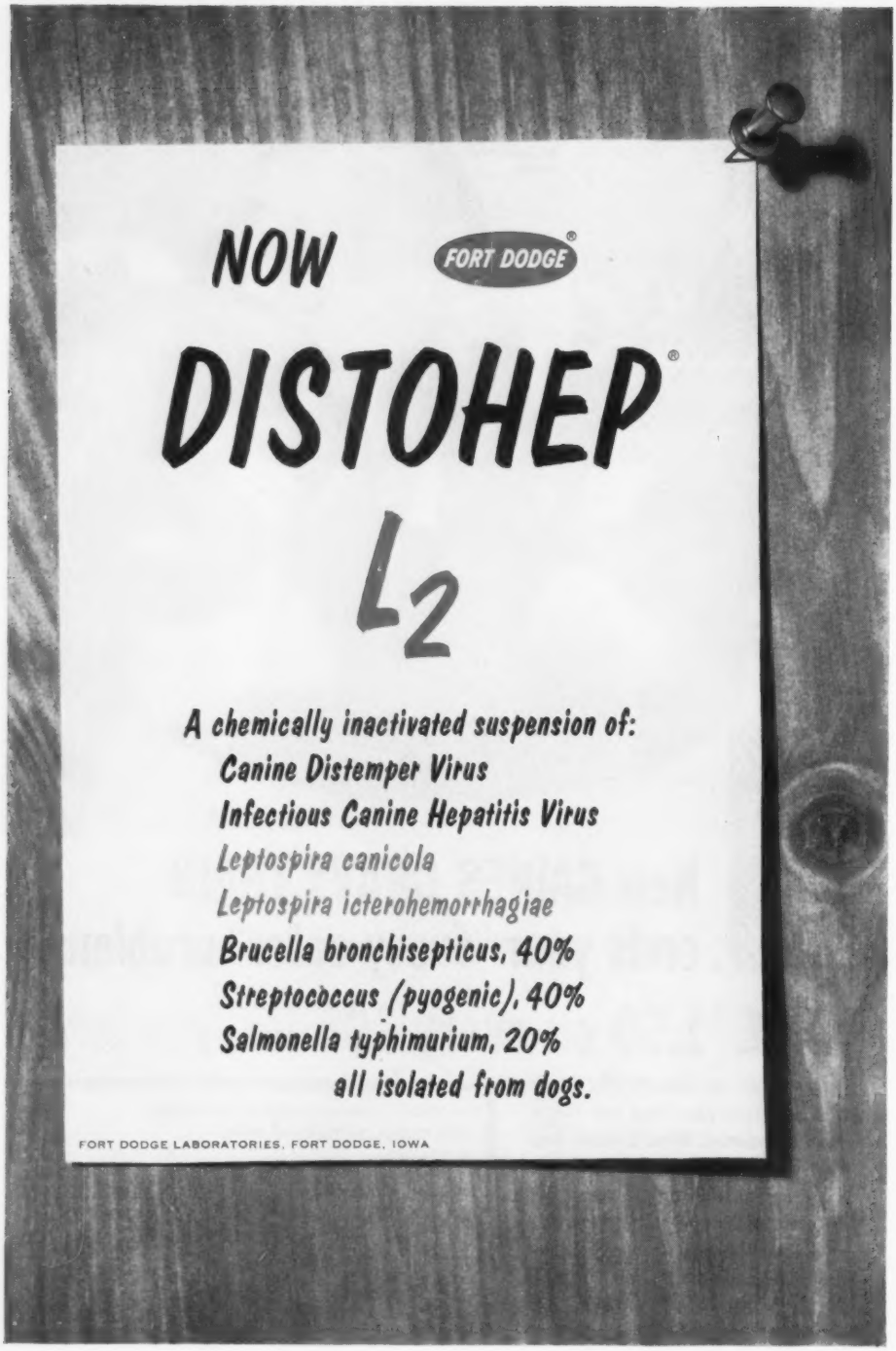
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Bovine Leptospirosis in Alabama —A Five-Year Study

Charles S. Roberts, D.V.M., M.S.; L. W. Turner, D.V.M., M.S.; J. H. Livingston, D.V.M.

THE FIRST report of leptospirosis in domestic animals in Alabama appeared in 1951.[6] Leptospiral agglutinins were demonstrated in cattle serum samples obtained from the brucellosis laboratory* a few months after the incident that led to this finding. Four per cent of the samples were positive in the 1:200 dilution or greater for *Leptospira pomona* agglutinins. Bovine leptospirosis was diagnosed in 18 herds located in the central area of Alabama from February through August, 1953.[8] No leptospires were isolated from samples of bovine urine submitted by practicing veterinarians during this period. However, organisms were demonstrated histologically in sections of kidney tissue from calves that died after clinical signs of the disease. *Leptospira pomona* agglutinins were demonstrated in serum samples collected by practicing veterinarians in the area and submitted to the Communicable Disease Laboratory, USPHS.

Our purpose is to make available results obtained with the microscopic-agglutination (agglutination-lysis) test on bovine serum samples during a five-year period and to report the isolation of two leptospiral serotypes from cattle in the state.

Materials and Methods

The microscopic-agglutination test[7] was used throughout the entire survey. Both Schuffner's modification[4] of Verwoot's medium and Stuart's medium[10] were employed to produce antigens. The test was conducted essentially as had been described.[2] Initially, tenfold dilutions of serum in saline solution (0.85% NaCl) were made from 1:10 through 1:10,000. Antigen was then added to each serum dilution in amounts equivalent to the diluted serum, so that the final dilutions were 1:20, 1:200, 1:2,000, and 1:20,000. The 1:10 dilution was subsequently discontinued as a test dilution; therefore, the first dilution to which antigen was added thereafter was the 1:100 serum dilution. The antigen-saline-serum mixture was incubated at 20 C. for two hours and examined for evidence of agglutination by darkfield microscopy. Titers were expressed as the greatest dilution in which an unmistakable agglutination reaction was observed or the greatest dilution in which approximately 25% of the cells were agglutinated.

Dr. Roberts is a member of the Animal Disease Research Department, Agricultural Experiment Station, Auburn University, and director of the Alabama Veterinary Diagnostic Laboratory, Auburn. Dr. Turner is director of the Veterinary Diagnostic Laboratory, Tennessee Livestock Sanitary Division, Department of Agriculture, Nashville. Dr. Livingston is inspector in charge, Poultry Inspection Service, Greensboro, N. Car.

Approved as publication No. 865 by the Committee on Publications, School of Veterinary Medicine, Auburn University.

*Cooperative State-Federal Bang's Disease Laboratory, Auburn, Ala.

From 1955 through 1957, all samples were tested against antigens composed of the following serotypes: *L. canicola*, *L. icterohaemorrhagiae*, *L. pomona*, and *L. sejroe*. These antigenic serotypes were used throughout the survey, except that *L. autumnalis* and *L. grippotyphosa* were substituted at times for *L. canicola* and *L. icterohaemorrhagiae*.

On Jan. 1, 1958, the dilution schema was changed to result in a fourfold dilution so that dilutions were 1:100, 1:400, 1:1,600, and 1:6,400. A change in the criterion of a positive test was also made at this time. A sample was considered positive when 50% or more of the cells were agglutinated. Leptospiral serotypes used were *L. canicola*, Ruebush; *L. icterohaemorrhagiae* AB, Wijnberg; *L. grippotyphosa*, Moscow; *L. pomona*, pomona; *L. pomona*, Johnson; *L. sejroe*, S-91, and *L. sejroe*, Mallersdorf. Mediums were enriched with 10% rabbit serum sterilized by passage through a Seitz EK or Selas 03 filter. Actively growing cultures of leptospires free of breeding nests or cell colonies and aberrant forms were employed as antigens. Cultures were incubated at temperatures from 25 to 30 C. for three to seven days. Centrifugation of the antigen at 1,600 r.p.m. for five minutes was useful in removing particles and thereby improving the quality of the antigen.

A routine procedure was established for the isolation of leptospires from tissue specimens, body fluids, and fetuses submitted to the laboratory. Solid tissue was immediately ground in a Tenbroeck tissue grinder, Waring Blender, or Servall Omni Mixer with saline solution, Schuffner's medium,[7] or Stuart's medium[10] and inoculated into artificial mediums and laboratory animals. Body fluids were also inoculated into the same mediums and animals. When a choice of material was available, such as was the case with an aborted fetus or young calf, body fluids only were used as inoculum. This fluid included a small amount of that present in the thoracic and abdominal cavities, urine, and occasionally aqueous or vitreous humor from the eye.

Isolation attempts made in the field were limited to the inoculation of artificial mediums and laboratory animals with voided collections of undiluted urine.

Artificial culture mediums employed during the five-year period were Chang's[9] and Fletcher's[2] semisolid agars. Laboratory animals used included guinea pigs, day-old chicks, gerbils, hamsters, and chinchillas. Only 2 or 3 drops of the inoculum was placed in the artificial culture medium, whereas 0.5 ml. was injected intraperitoneally into the laboratory animal. Whenever sufficient animals were available, each specimen or pool of specimens from a single animal was inoculated into laboratory animals and either Chang's or Fletcher's medium. Limited use was made of laboratory animals other than chinchillas after susceptibility of this species to both *L. pomona* and *L. canicola* was established.[8]

Inoculated mediums were incubated at 25 to 28 C. and examined for presence of leptospires at weekly intervals for six weeks. Blood samples were obtained from laboratory animals on postinoculation (PI) days 3, 6, and 9 and again on about PI day 21. Blood was obtained by cardiac puncture, and 1 to 3 drops was placed in one of the mediums. Cultures were incubated and examined in the manner previously described. Subcultures of all leptospiral isolates were sent to the Veterinary Division, Walter Reed Army Institute of Research, or Communicable Disease Center, USPHS, for identification.

Results of Serologic Survey

Brucellosis Laboratory; 1955 Through 1957.—A total of 690 samples representing 118 herds located in widely separated areas of the state were selected for examination (Table 1). The purpose of examining these samples was to obtain information on the incidence of leptospiral agglutinins in the over-all cattle population in contrast to those found in herds with clinical manifestations of the disease and represented by the samples from the Diagnostic Laboratory.

Samples received at the brucellosis laboratory during the survey period were principally from cattle in dairy herds required to have an annual brucellosis test, cattle being transported or moved to an area requiring a negative test to satisfy a requirement for issuance of a health certificate, and cattle in counties that were being reaccredited under the brucellosis accreditation program. The results of this phase of the survey are believed to represent the incidence of agglutinins to four leptospiral serotypes in the apparently normal, healthy cattle of the state. The high percentage of samples with *L. sejroe* agglutinins suggested that *L. sejroe* or an antigenically related leptospiral serotype was common to cattle of this area but evidently did not produce clinical signs of disease.

Diagnostic Laboratory Samples; 1955 Through 1957.—Samples submitted to the Diagnostic Laboratory by practicing veterinarians were obtained principally from cattle in herds that evidently had some clinical signs suggestive of leptospirosis. This part of the survey probably includes samples collected from cattle in herds with no history of abortions or other manifestations of leptospirosis. These data are not considered to represent the incidence of leptospirosis in the cattle population of the state, but they are presented as a survey of suspicious or selected cattle for leptospiral agglutinins. Titration results from 3,811 serum samples to *L. pomona* antigen

TABLE 1—Titration Results on 690 Bovine Serum Samples (from Brucellosis Laboratory) to Four Leptospiral Serotypes During 1955

Serotype		Dilutions 1:200	1:2,000	1:20,000	Total	Positive
L. pomona	Pred. titers*	39	4	0	43	(6%)†
	Equiv. titers**	5	0	0	5	(1%)
	Total	44 (6%)	4 (1%)	0	48	(7%)
L. sejroe	Pred. titers	134	31	0	165	(24%)
	Equiv. titers	0	0	0	0	(....)
	Total	134 (19%)	31 (4%)	0	165	(24%)
L. canicola	Pred. titers	9	0	1	10	(1%)
	Equiv. titers	2	0	0	2	(1%)
	Total	11 (2%)	0	1 (1%)	12	(2%)
L. ictero-haemorrhagiae	Pred. titers	3	0	0	3	(1%)
	Equiv. titers	0	0	0	0	(....)
	Total	3 (1%)	0	0	3	(1%)

*Predominant titers = number of samples with highest titer to this serotype. **Equivalent titers = number of samples with the same titer to this and another serotype. †Percentages gives are the nearest whole number.

and a lesser number of these same samples to five other leptospiral serotypes are shown (Table 2).

Using a tenfold dilution schema, it was not possible to establish in many of the samples containing two or more leptospiral agglutinins the one with the highest titer. In herds known to be infected with *L. pomona*, equivalent agglutinin titers in single samples to *L. pomona* and *L. autumnalis* antigens were common. To a lesser extent equivalent titers to *L. sejroe* and

TABLE 2—Titration of Bovine Serum Samples Received at Diagnostic Laboratory to Six Leptospiral Serotypes; 1955 Through 1957

Serotype		Dilutions 1:200	1:2,000	1:20,000	Total	Positive
L. pomona (3,811 samples)	Pred. titers*	450	225	15	690	(18%)†
	Equiv. titers**	275	34	0	309	(8%)
	Total	725 (19%)	259 (7%)	15 (1%)	999	(26%)
L. sejroe (1,565 samples)	Pred. titers	226	54	1	281	(18%)
	Equiv. titers	112	18	0	130	(8%)
	Total	338 (22%)	72 (5%)	1 (1%)	411	(26%)
L. autumnalis (2,885 samples)	Pred. titers	41	8	2	51	(2%)
	Equiv. titers	253	29	0	282	(10%)
	Total	294 (10%)	37 (1%)	2 (1%)	333	(12%)
L. canicola (811 samples)	Pred. titers	9	1	2	12	(1%)
	Equiv. titers	11	1	0	12	(1%)
	Total	20 (2%)	2 (1%)	2 (1%)	24	(3%)
L. ictero-haemorrhagiae (489 samples)	Pred. titers	6	0	1	7	(1%)
	Equiv. titers	10	0	1	11	(2%)
	Total	16 (3%)	0	2 (1%)	18	(4%)
L. grippotyphosa (757 samples)	Pred. titers	1	0	0	1	(1%)
	Equiv. titers	110	7	0	117	(15%)
	Total	111 (15%)	7 (1%)	0	118	(16%)

*Predominant titers = samples with highest titer to this serotype. **Equivalent titers = samples with the same titer to this and another serotype. †Percentages given are the nearest whole number.

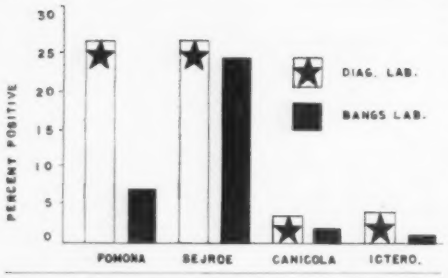

Fig. 1—Comparison of titers to four leptospiral serotypes from samples from Diagnostic Laboratory and a brucellosis laboratory, 1955 through 1957.

L. grippotyphosa were also demonstrated. Agglutinins to the latter serotype were not titrated in samples other than those obtained from *L. pomona* infected herds which probably accounts for the high percentage of samples with an equivalent titer to *L. grippotyphosa* and at least one other leptospiral serotype.

On comparison of the data from this phase of the survey with those from the brucellosis laboratory survey (Fig. 1), there's more than a threefold increase of samples with *L. pomona* agglutinins yet practically no increase in the number with *L. sejroe* agglutinins. The source from which the samples came did not significantly influence the number with *L. sejroe* agglutinins.

Diagnostic Laboratory Samples; 1958 and 1959.—In order to reduce the number of samples titrated to the same end point with two or more antigens and to bring further uniformity to the methods employed by the many laboratories using the microscopic-agglutination test, fourfold serum dilutions were made of all samples examined during this period.

During 1958, 2,157 cattle serum samples were titrated against the following four leptospiral serotypes: *L. pomona, L. sejroe, L. canicola,* and *L. autumnalis* (Table 3). The following year, *L. grippotyphosa* antigen was substituted for *L. autumnalis*. The number of samples titrated during 1959 to each of the four antigens varied slightly, principally because of difficulties associated with antigen production. Of 3,745 samples titrated for *L. pomona* agglutinins, 3,500 were also examined for agglutinins to the other three leptospiral serotypes.

Combined Data from Diagnostic Laboratory Samples for Five-Year Period.—Since the serum dilutions used in the microscopic-agglutination test were not constant throughout the survey period, it is not possible to combine the data and obtain the number of positive samples in each dilution for the entire five-year period.

TABLE 3—Titration of Bovine Serum Samples Received at Diagnostic Laboratory to Five Leptospiral Serotypes; 1958 and 1959

Serotype		Dilutions 1:100	1:400	1:1,600	1:6,400	Total	Positive
L. pomona (5,902 samples)	Pred. titers*	977	579	305	128	1,989	(34%)†
	Equiv. titers**	104	60	12	9	185	(3%)
	Total	1,081 (18%)	639 (11%)	317 (5%)	137 (2%)	2,174	(37%)
L. sejroe (5,870 samples)	Pred. titers	1,026	700	212	41	1,979	(34%)
	Equiv. titers	66	44	4	9	123	(2%)
	Total	1,092 (19%)	744 (13%)	216 (4%)	50 (1%)	2,102	(36%)
L. autumnalis (2,157 samples)	Pred. titers	19	12	2	0	33	(2%)
	Equiv. titers	70	24	6	10	110	(5%)
	Total	89 (4%)	36 (2%)	8 (1%)	10 (1%)	143	(7%)
L. canicola (5,748 samples)	Pred. titers	137	40	6	0	183	(3%)
	Equiv. titers	38	15	2	9	64	(1%)
	Total	175 (3%)	55 (1%)	8 (1%)	9 (1%)	247	(4%)
L. grippo-typhosa (3,503 samples)	Pred. titers	62	6	0	0	68	(2%)
	Equiv. titers	10	0	0	0	10	(1%)
	Total	72 (2%)	6 (1%)	0	0	78	(2%)

*Predominant titers = samples with highest titer to this serotype. **Equivalent titers = samples with the same titer to this and another serotype. †Percentages given are the nearest whole number.

However, if the significance of prozonal reactions is disregarded, any sample titrated to a positive end point in the 1:200 dilution from 1955 through 1957 would also have been positive in the 1:100 dilution. Therefore, figures representing the number of samples titrated to end point in the first dilution during the two parts of the survey have been combined and shown as samples positive in the 1:100 dilution (Table 4). Data obtained from the other dilutions have been combined and expressed as samples having titers in excess of the 1:200 dilution.

Results of Isolation Attempts.—During the five-year period, 136 attempts were made to isolate leptospires from live cattle, aborted fetuses, or calves that died soon after birth. Most of the material from which isolations were attempted was sent to the Diagnostic Laboratory by commercial carriers and was more than 24 hours old when received. No isolations were made from material of this type. Fourteen isolations were accomplished from the urine of cattle or body fluids of aborted fetuses in eight herds. Eleven of the 14 isolations were accomplished by inoculating laboratory animals at the farm with urine obtained from cows which had recently aborted. The other three isolations were made from aborted fetuses brought to the laboratory by herdsmen as soon as they were discovered.

The first isolation of leptospires from cattle in Alabama was from a cow that had recently aborted. Several cows in the herd had aborted and an atypical form of mastitis was present in others at the time urine samples were collected for animal inoculation. Voided specimens were collected from 10 cows in this herd, and a sample of each was inoculated into a guinea pig and either a chinchilla or a hamster. Leptospires were demonstrated in Chang's medium inoculated with blood from 1 chinchilla and 1 guinea pig, each having been given urine from a different cow.

The serum antibody titer of 1 infected cow at the time of collection of the urine was 1:20,000 to *L. pomona* and 1:200 to *L. autumnalis* and *L. grippotyphosa* antigens. Serum from another infected cow in the herd was titrated to end point in the 1:20 dilution to *L. sejroe* and the three aforementioned antigens. Isolates from these 2 cows were typed serologically on the basis of a cross agglutination-lysis

TABLE 4—Titration of Bovine Serum Samples to Six Leptospiral Serotypes During a Five-Year Period; Combined Data from Tables 2 and 3

Serotype		Dilutions			
		1:100 & 1:200	All other	Total	Positive
L. pomona (9,713 samples)	Pred. titers*	1,427	1,252	2,679	(28%)†
	Equiv. titers**	379	115	494	(5%)
	Total	1,806 (19%)	1,367 (14%)	3,173	(33%)
L. sejroe (7,435 samples)	Pred. titers	1,252	1,008	2,260	(30%)
	Equiv. titers	178	75	253	(3%)
	Total	1,430 (19%)	1,083 (15%)	2,513	(34%)
L. autumnalis (5,042 samples)	Pred. titers	60	24	84	(2%)
	Equiv. titers	323	69	392	(8%)
	Total	383 (8%)	93 (2%)	476	(10%)
L. canicola (6,559 samples	Pred. titers	146	49	195	(3%)
	Equiv. titers	49	27	76	(1%)
	Total	195 (3%)	76 (1%)	271	(4%)
L. ictero-haemorrhagiae (489 samples	Pred. titers	6	1	7	(1%)
	Equiv. titers	10	1	11	(2%)
	Total	16 (3%)	2 (1%)	18	(4%)
L. grippo-typhosa (4,260 samples)	Pred. titers	63	6	69	(2%)
	Equiv. titers	120	7	127	(3%)
	Total	183 (4%)	13 (1%)	196	(5%)

*Predominant titers = samples with highest titer to this serotype. **Equivalent titers = samples with the same titer to this and another serotype. †Percentages given are the nearest whole number.

pattern as belonging to the serotype *L. pomona* by Walter Reed Army Institute of Research.

After several transfers in artificial culture mediums, the *L. pomona* isolate was demonstrated to be more pathogenic for chinchillas than for hamsters or guinea pigs and could also be recovered sooner from the chinchillas than from the other two species.[5] All subsequent isolation attempts in which laboratory animals were used were made with chinchillas.

All isolations made prior to July, 1957, had been strains of *L. pomona* serotype except one previously reported.[11] This isolation was made from urine voided by a day-old calf and serologically typed as *L. canicola*. *Leptospira canicola* was later isolated from a bovine fetus brought to the Diagnostic Laboratory from a farm located in another part of the state on July 23, 1957. This is the second reported isolation of this serotype from cattle in North America. By the time this isolate was serologically typed, the cow that aborted the fetus had been sold for slaughter, and the herd put on range. Serologic tests were not made on any cattle in this herd.

Both body cavities of the 3 fetuses from which isolations were made contained 100 to 300 ml. of a reddish brown fluid devoid of red blood cells. The perirenal fat and subcutaneous tissues of the umbilical, flank, neck, and shoulder regions were also infiltrated with the same type fluid. Ecchymotic hemorrhages on the dorsal surface of the diaphragmatic lobes of the lungs were a constant finding. A reddish brown discoloration of the skeletal muscles was quite evident in contrast to the pale pink muscle tissue of a healthy calf. These lesions are believed to be associated with leptospirosis but cannot be considered pathognomonic since these lesions were present in other fetuses from which leptospires were not isolated.

Discussion

Although only 690 samples from the brucellosis laboratory were examined, it is considered significant that only 7% of the samples were titrated to *L. pomona* in contrast to 26% of the samples examined from the Diagnostic Laboratory during 1955 through 1957. It is also significant that 24% of the samples from the brucellosis laboratory were titrated to *L. sejroe*. The percentage of samples titrated to this serotype does not appear to differ from that obtained from the Diagnostic Laboratory samples (26%) during the same period. These data strongly suggest that agglutinins to *L. sejroe* antigen are found in cattle originating in this state without regard to any present or previous history of clinical leptospirosis. Agglutinins in cattle serum samples measured with *L. sejroe* antigen are believed to be specific leptospiral agglutinins to a serotype in the *hebdomadis* group, not necessarily *L. sejroe* but a serotype that is apparently not associated with any clinical or recognizable manifestations of leptospirosis. This hypothesis is supported by the fact that *L. sejroe* agglutinins alone were not demonstrated in high dilutions in any herd studied at the time abortions were occurring.

The increase in the number of positive *L. pomona* and *L. sejroe* samples during the last two years of the survey is not interpreted to mean that leptospirosis has become more widespread in the cattle population of Alabama. Veterinarians submitting samples to the Diagnostic Laboratory during 1958 and 1959 were more familiar with the signs of the disease and, therefore, more selective in submitting samples than during the early years of the survey. Also, during 1958 and 1959, the lowest dilution used was 1:100 in contrast to the 1:200 dilution employed for the 1955 through 1957 period. Since some of the cattle from which samples were collected during 1958 and 1959 were vaccinated with *L. pomona* vaccine, the increase in the number of samples with low agglutinin titers to *L. pomona* may be the result of vaccination. Titers obtained with *L. autumnalis*, *L. icterohaemorrhagiae*, and *L. grippotyphosa* antigens are considered to be, for the most part, cross-agglutination reactions. The number of samples having a predominant titer to each of these leptospiral serotypes was less than those with an equivalent titer to the homologous antigen and another antigenic serotype or serotypes. This, however, is not true for *L. canicola* agglutinins. Of the 273 samples titrated to this serotype, 197 of them were predominant titers. Since *L. canicola* has been isolated from cattle in Alabama, these data are interpreted to mean that other *L. canicola* infections in cattle exist, but are not nearly as widespread as is *L. pomo-*

na or the serotype responsible for the *L. sejroe* reactions obtained in this study.

The large number of equivalent titers to two or more leptospiral serotypes obtained with the same serum sample during the early phase of the survey has clearly shown the inadequacy of a tenfold dilution schema for detecting the predominant agglutinin in samples containing multiple leptospiral agglutinins.

Failure to isolate leptospires from material transported to the laboratory by a common commercial carrier seems to demonstrate the futility of attempting isolations from anything other than fresh material. Leptospires apparently do not survive long in urine or body fluids from dead animals. In some instances, leptospires were not isolated from tissue demonstrated to contain them by silver-staining techniques. Direct cultures of urine from infected cows have not yielded leptospires presumably because of the presence of contaminating bacteria.

Summary and Conclusion

1) Of 690 serum samples obtained from the brucellosis laboratory during 1955 and 1956, 7 and 24% were positive in the 1:200 dilution or higher to *Leptospira pomona* and *L. sejroe* agglutinins, respectively.

2) The incidence of *L. sejroe* agglutinins in bovine serum samples from both brucellosis and diagnostic laboratories was approximately the same, whereas the incidence of *L. pomona* agglutinins in samples from the latter source was much less. *Leptospira sejroe* agglutinins alone in high dilutions were never demonstrated from cattle in herds with a history of recent abortions.

3) *Leptospira pomona* and *L. sejroe* agglutinins were demonstrated in 33% and 34%, respectively, of more than 7,000 bovine serum samples obtained from the Alabama Veterinary Diagnostic Laboratory during a five-year period. Positive serologic reactions were also demonstrated with the following antigenic serotypes: *L. grippotyphosa, L. canicola, L. icterohaemorrhagiae,* and *L. autumnalis.*

4) Data are presented to demonstrate the inadequacy of a tenfold serum dilution schema to detect a predominant leptospiral agglutinin with the microscopic-agglutination test.

5) Both *L. pomona* and *L. canicola* serotypes were isolated from cattle, calves, and fetuses.

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Aspergillus Abortion in Mares

Abortions in 3 mares were caused by hyphomycetes. In all cases fungiform organisms and spores were found in the fetal membranes or in the fetal organs. In 2 horses the hyphomycete responsible for the abortion could be isolated in culture and identified as *Aspergillus fumigatus.—Berl. Münch. tierärztl., 74, (Aug., 1961): 293.*

Bovine Leptospirosis—A Hazard to Man

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THE FIRST isolation of *Leptospira pomona* was made from a dairy farmer near Pomona, Australia, and was reported in 1937.[5] Serologic evidence of infection with this organism was found in cattle in the same area, suggesting to the authors that the disease might have been transmitted from cattle to man. In 1944, this organism was isolated from cattle in Argentina.[24] This was the same year leptospires were demonstrated microscopically in a bovine kidney in the United States.[14]

Not until 1948 was the first isolation of leptospires reported from cattle in this country.[1] This isolate was later identified as *L. pomona*.[12] It has been amply demonstrated that *L. pomona* infection occurs in persons associated with dairy cattle in the United States,[2,3,6,8,13,18,25,26] but the frequency of transmission is unknown.

The present study was undertaken to determine the frequency with which such transmission occurs in Ohio.

Methods

Frequency of transmission was analyzed by two methods: (1) a serologic survey of persons in contact with known *Leptospira*-infected dairy herds throughout Ohio; (2) a serologic survey of a number of veterinarians practicing large animal medicine in Ohio.

Dairy farms were selected which were known to have at least 4 cattle reacting to *L. pomona* at a dilution of 1:100 or greater as determined by the agglutination-lysis (AL) test.[27] For the purpose of this study, cattle with titers of this magnitude were considered positive.

The attending veterinarian was then visited by a representative of the Ohio Department of Health, and his permission was secured to interview the owner of the farm. An attempt was made to obtain blood samples from every member of the farm household. These were tested by means of the microscopic-agglutination (MA) test for the presence of antibodies against *Leptospira canicola*, *Leptospira icterohaemorrhagiae*, and *L. pomona*.[27]

The second phase of this study consisted of collecting blood specimens from practicing veterinarians at the 1955, 1957, 1959, and 1961 annual conventions of the Ohio Veterinary Medical Association. These specimens were tested as previously described.

Descriptions of the clinical illnesses in the human patients were obtained from the patients and then verified with the attending physicians.

Results

Phase 1.—Forty infected dairy herds were visited, and blood specimens were collected from 86 of the 97 persons having regular contact with the cattle in these herds. Of this number, two samples (2.3%) were found to contain *L. pomona* antibodies and MA titers of 1:100 or greater (vide infra).

Five dogs were tested on two farms. Three had MA titers of 1:128 or greater for *L. pomona*, with no significant titer for the other two serotypes.

In all, 1,007 of a possible 1,765 cattle were tested, and 327 were positive. The herd size ranged from 10 to 125 cattle with a mean of 44.

Blood samples were collected from 502 cattle in 15 herds; 152 (30.3%) were reactors. Blood samples were collected from 556 cattle in an additional 11 herds. Of these, 336 were tested and 108 (32.1%) were reactors.

This study was not designed to describe the clinical syndrome in cattle. However, the following statements seem worthy of mention. Four herdsmen denied the pres-

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The agglutination-lysis tests were performed by the Reynoldsburg Diagnostic Laboratories of the Ohio Department of Agriculture. The microscopic-agglutination tests were performed by the Division of Laboratories, Ohio Department of Health.

ence of clinical illness in their herds. In each case, these histories were substantiated by the attending veterinarian.

Abortion was the most commonly reported sign, having been mentioned in 30 herds. Flaccid mastitis was next, occurring in 11 herds. Although only seven herds reported hemoglobinuria and only two reported fatalities (seven deaths in all), in both herds with fatalities there was hemoglobinuria. This is consistent with the reports of others.[1,9] In 6 herds, breeding difficulties after infection were reported.

The two cases in persons occurred in males, ages 33 and 45. This predominance in males was probably a reflection of the sample population (69 males, 17 females). Since 40% of the sample population was between 31 and 45 years old, the ages of the two are of doubtful significance.

Case 1.—No illness was noticed in this herd until May when four cases of atypical mastitis appeared in 22 brucellosis-free milking Holstein-Friesian cattle. In early August, 2 cows were off feed for a short time. Two weeks later, these 2 cows plus 2 others aborted. All 4 were serologically positive for leptospirosis at the time of abortion.

Our investigation began in middle October, at which time it was discovered the herd owner had a titer of 1:128 for *L. pomona*. His wife and eldest son were negative; the other 3 children were not ordinarily in contact with the cattle and were not tested.

The herd owner said that he had been in excellent health until the morning of August 1, when he suddenly felt dizzy and weak. During the rest of that day, he continued to work, but felt "poorly" and ached all over. In the evening, he had chills and fever. On August 2, he consulted a physician who found nothing remarkable except a temperature of 103 F. Penicillin was administered and he returned home. During the next few days, "I felt worse than I ever have in my life." The primary symptoms were fever, muscle aches, and extreme weakness. Another injection of penicillin was administered August 4. By August 6, although weakness was still present, the muscle pain and fever had subsided considerably. This improvement continued until August 8, when an extreme occipital headache plus pain and stiffness of the neck developed. Both of these symptoms grew worse during the day. He returned to his physician that evening, and was given another injection of penicillin. By the end of the week he was symptom-free except for mild weakness.

This history represents a classic description of the two-phase clinical picture described in European swineherd's disease, an influenza-like illness followed by meningeal signs.[6]

Urine specimens were obtained from 3 cattle in this herd and injected into hamsters in an attempt to isolate leptospires, but none were found.

Case 2.—The herd on this farm consisted of 100 brucellosis-free Holstein-Friesian cattle. The first sign of disease was noticed July 20 when a cow aborted at the eighth month of gestation. This was followed rapidly by a series of illnesses in other cattle, characterized by a fever of 105 to 106 F., anorexia, sudden drop in milk production, depression, and a few cases of flaccid mastitis.

Since there was a history of a shovel accidentally being run through the hay chopper earlier in the year, the attending veterinarian made a tentative diagnosis of traumatic gastritis and administered penicillin. Improvement followed within 24 hours after treatment.

One more cow aborted late in July and a third on August 1. The owner handled this third fetus with his bare hands. This cow had a titer of 1:1,024 for *L. pomona* and 1:64 for *L. icterohaemorrhagiae* when tested August 22.

On August 13, the owner became suddenly ill, evidencing malaise, anorexia, depression, weakness, epigastric pain, and headache. Two days later, he visited his physician, who made a tentative diagnosis of influenza and administered penicillin to combat the fever of 102 F. The patient was unable to work for 28 days after the onset of illness.

Serum collected from this patient on August 22 was negative for all 3 serotypes. Serum samples drawn September 14 and October 2 were positive (1:512) for *L. pomona* and negative for *L. canicola* and *L. icterohaemorrhagiae*. A presumptive diagnosis of leptospirosis was made on this basis.

Serum samples from the patient's wife and two teenage children were negative. Serum titers of the 4 dogs on this farm are given (Table 1). The 2 dogs with *L. pomona* titers roamed free and had contact with the cattle. The other 2 dogs were kept

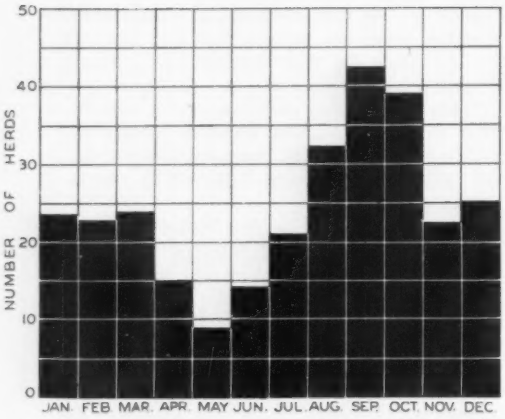

Fig. 1—The five-year mean, 1956 to 1960, of the seasonal incidence of bovine leptospirosis in Ohio. (The source is *Animal Disease Trends*, Ohio Department of Health and the Ohio Department of Agriculture.)

tied at all times. Attempts to isolate leptospires from the urine of 3 cattle and of the stock dog by intraperitoneal inoculation into hamsters and guinea pigs were unsuccessful.

Phase 2.—Blood specimens were collected from 398 veterinarians at the 1955, 1957, 1959, and 1961 annual conventions of the Ohio Veterinary Medical Association. In all, 155 defined themselves as large animal practitioners.

None of this group had detectable antibodies for *L. canicola* or *L. icterohaemorrhagiae*. One had a titer of 1:128 for *L. pomona*.

Seven months prior to the time of the survey, this practitioner had been a patient of a local physician. The onset of his illness was vague, with general malaise, myalgia, weakness, nausea, vomiting, severe headache, and a temperature of 101 F.

The condition was diagnosed as influenza, and tetracycline was prescribed.

The patient did not improve after four days, so penicillin was added to the daily treatment regimen. Treatment was discontinued seven days after onset, with the patient much improved. The blood count was essentially normal except for a slight leukopenia. Typhoid and *Brucella* agglutination tests were negative at the time of survey.

Although these findings suggest a possible diagnosis of leptospirosis, the time interval between the illness and the discovery of the titer precludes any definite conclusions.

This practitioner had collected blood samples from a few herds in his practice but had never discovered any cattle with leptospiral antibodies, although there were a number of herds in contiguous counties in which leptospirosis had been diagnosed.

Discussion

The seasonal variation of leptospirosis has been described by nearly every author discussing the disease. The mean monthly incidence of bovine leptospirosis in Ohio as reported by practicing veterinarians is illustrated (Fig. 1). The two cases of suspected leptospirosis in farmers, with onset in August, coincided with the season of increased incidence of leptospirosis in cattle. The veterinarian first became ill in June.

The relative importance of *L. pomona* to human leptospirosis in the United States has been discussed[19]; of 89 cases in this country which were traced to their source, 36% had contact with infected cattle or swine in abattoirs or on farms. In a recent Ohio study,[20] 23 of 1,908 (1.2%) abattoir workers had titers of 1:64 or greater for *L. pomona*.

Considering the ample sources of the organism present on a farm when even 1 cow is infected, the chance of exposure for a herdsman is good.

Leptospira pomona has been isolated from milk during the leptospiremic phase of the disease.[1,21] Although it has been demonstrated experimentally that milk has

TABLE 1—Leptospiral Titers in the Dogs on an Ohio Farm Where Leptospiral Infections in Cattle and Man Had Occurred

	Cattle contact	L. canicola			L. icterohaemorrhagiae			L. pomona		
		8/22	9/14	10/2	8/22	9/14	10/2	8/22	9/14	10/2
Stock dog	Yes	1:64	Neg.	Neg.	1:64	Neg.	Neg.	1:2,048	1:1,024	1:512
Hound pup	Yes	N.T.*	Neg.	Neg.	N.T.	Neg.	Neg.	N.T.	1:128	1:128
Hound female	No	N.T.	Neg.	Neg.	N.T.	1:64	1:32	N.T.	Neg.	Neg.
Hound male	No	N.T.	Neg.	N.T.	N.T.	Neg.	N.T.	N.T.	Neg.	N.T.

*N.T. = not tested.

an anti-leptospiral effect in a matter of a few hours,[15,16] a portion of our rural population still persists in drinking warm raw milk fresh from the cow, affording a possible opportunity for infection. This, of course, would be likely to occur only with cattle harboring inapparent infections.

The occasional presence of infectious *L. pomona* organisms in the aborted fetuses of cattle manifests a distinct hazard to veterinarians and husbandrymen assisting aborting cattle or handling fetuses.[7,23]

Undoubtedly, the greatest danger of infection in man is from the urine of convalescent cattle. One group of workers reported[11] that urine from 1 heifer contained an estimated concentration of organisms of 10^8/ml., a concentration heavier than is found in many cultures maintained under laboratory conditions.

Contact with urine can occur through swimming in contaminated water,[3,25] walking barefoot in the barnyard[17] or, conceivably, while performing routine husbandry duties such as milking cows or cleaning the barn. Extreme caution is essential while assisting in cases of dystocia or removing retained fetal membranes. It is virtually impossible to perform these tasks without coming in contact with the animal's urine. The practicing veterinarian must not only exercise extremely rigid sanitation practices at these times but is responsible for ascertaining that the owner understands the true danger to himself.

Titers for *L. pomona* were found in 3 of 5 dogs tested. Two of these dogs with *L. pomona* titers are described in Table 1. The other dog had a titer of 1:320 for *L. pomona* and 1:40 for the other 2 serotypes. The epidemiologic significance of this finding is supported by others who have suggested that dogs may become occasional carriers of *L. pomona*.[4,19,22] Further studies are necessary to establish the role of the dog in the epidemiology of this serotype.

The numbers involved in this study are admittedly small; the results, however, may warrant further studies along this line. The current disregard of *L. pomona* infection in cattle as a public health hazard might be altered as a result.

Summary

Forty dairy herds presumed to be infected with leptospirosis were visited, and blood samples were collected from 86 persons in contact with these cattle. Two probable infections with *Leptospira pomona* in man were found.

Of 155 serum samples from veterinarians practicing large animal medicine in Ohio, one had a titer for *L. pomona*.

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Use of Adrenal Cortical Compounds in Hemorrhagic Shock

In the event of hemorrhage severe enough to lower blood pressure below 80 mm. of mercury, immediate replacement of the blood lost should first be attempted. However, if blood is not immediately available, or if the hypotension does not respond to its administration, a large dose of hydrocortisone should be given intravenously within 30 minutes after the hypotensive state has begun. Spectacular and sustained elevation of blood pressure in dogs in profound hemorrhagic shock was induced by doses of 100 to 300 mg. of hydrocortisone. It had no effect on restoration of blood pressure if injected later than 45 minutes after the severe shock state had been induced. When the drug was successful, its effect was almost always observed within five minutes and never more than ten minutes after injection. The effect of a single injection usually extended over a period of three hours.

During shock, circulating levels of adrenocortical hormones are usually high so that the mode of action seems to be related to the metabolism of the hormone rather than to a deficiency or an inadequate output.—*J. Lancet, 79, (Oct., 1959): 460.*

Leptospirosis in Cattle and Wildlife on a Pennsylvania Farm

L. G. Clark, D.V.M.; J. I. Kresse, B.S., E. A. Carbrey, V.M.D.; R. R. Marshak, D.V.M.; C. J. Hollister, D.V.M.

DURING the course of an epizootiologic study of leptospirosis on a farm in southeastern Pennsylvania, it was possible to demonstrate an unusual serotype pattern among the cattle and wildlife. *Leptospira hardjo* was isolated from a cow with clinical signs of leptospirosis, and *L. icterhaemorrhagiae*, *L. pomona*, and *L. ballum* were isolated from the wildlife. In addition, serum samples from the cow and from other cattle on the same premise reacted to *L. icterohaemorrhagiae* and *L. sejroe* antigens, suggesting the possibility of multiple serotype infection.

Materials and Methods

The mediums used were: Fletcher's semisolid medium (Difco) with 10% rabbit serum; Fletcher's semisolid medium with 15% horse serum; Chang's semisolid medium[2] (Hamilton, Montana modification[4]) with 10% rabbit serum; Chang's semisolid medium with 15% horse serum; and Stuart's semisolid medium[3] with 10% rabbit serum.

Antigen cultures were maintained in Stuart's liquid medium (Difco) with 10% rabbit serum enrichment. Serum samples were tested for leptospiral antibodies by the microscopic-agglutination test employing previously devised techniques.[1] Eleven serotypes were used in the live-antigen test bank: *L. bataviae*, *L. pomona*, *L. autumnalis*, *L. ballum*, *L. canicola*, *L. icterohaemorrhagiae*, *L. alexi*, *L. grippotyphosa*, *L. australis A.*, *L. sejroe*, and *L. hyos*.

The following methods were employed in making leptospiral isolations from cattle.

1) *Urine Cultures.*—Midflow urine was collected, serially diluted from 10^{-1} through 10^{-5} with Stuart's liquid medium base containing 10% rabbit serum. One to 3 drops of each dilution was inoculated into one tube of each of the above mediums. All inoculated tubes were incubated for a minimum of six weeks at 29 C. and examined for growth by darkfield microscopy at 10- to 14-day intervals.

2) *Hamster Passage.*—Bovine urine (0.5 ml.) was inoculated intraperitoneally into each of 4 weanling hamsters. Inoculated hamsters were weighed daily. Heart blood was collected at 7 to 10 days postinoculation or at the time of weight loss, and 1 to 3 drops was inoculated into one tube of each of the mediums described. Hamsters were killed 18 days postinoculation. One kidney was aseptically removed from each animal, ground in a Ten Broeck tissue grinder, and diluted to a 10% tissue suspension with Stuart's liquid medium base enriched with 10% rabbit serum.

One to 3 drops of the suspension was inoculated into one tube of each of the mediums described. Serial tenfold dilutions of the kidney suspension through 10^{-5} were prepared, and 1 to 3 drops of each dilution was inoculated into single tubes of Fletcher's medium with rabbit serum enrichment. Second and subsequent serial hamster passages were made by inoculating 4 weanling hamsters with 0.5 cc. of a 10% suspension of kidney tissue from the preceding passage. At the time of kidney harvest from each passage, kidney suspensions were examined directly for leptospires by darkfield microscopy.

Trapping activities began immediately after isolation of leptospires from cow 318 and were limited to the farm on which this animal lived. Three trap types were employed: (1) Victor coil-spring and leaf-spring traps,* (2) Sherman live traps for small rodents,** and (3) Havaheart live traps.† Traps were placed, examined, and rebaited daily until approximately 100 wildlife specimens had been collected. Trapped animals were removed from the traps and transported alive to the Leptospirosis Laboratory, University of Pennsylvania. Upon arrival at the laboratory, the animals were killed by asphyxiation in a carbon monoxide chamber. Small rodents were killed in a choroform chamber. Immediately after removal from the killing chamber, blood was collected from all specimens, except small rodents, by severing the jugular vein. Serum was

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The authors thank Dr. H. C. Neibert, York, Pa., for referring cow 318 to us for study.

*Animal Trap Co. of America, Lititz, Pa.
**H. J. Spencer & Sons, Gainesville, Fla.
†Havaheart Co., Ossining, N. Y.

TABLE 1—Microscopic-Agglutination Test Titers of Serum Samples from 11 Cattle Housed and Pastured as a Group

Animal	L. icterohaemorrhagiae titer	L. sejroe titer
Cow 318	1:1,600	1:400
Steer 1	1:1,600	1:1,600
Steer 2	1:400	1:100
Steer 3	1:100	1:400
Steer 4	1:400	1:400
Steer 5	1:1,600	1:1,600
Steer 6	1:400	1:400
Steer 7	1:400	1:400
Steer 8	1:100	1:100
Steer 9	1:1,600	1:400
Steer 10	1:100	1:400

removed from each blood sample, properly identified, and stored until tested for leptospiral antibodies by the aforementioned microscopic-agglutination test.

After exsanguination, each animal was fixed to a board and cleaned by hosing with hot water. The abdominal area was shaved and then painted with disinfectant solution.‡ One kidney was removed aseptically and cultured as described for hamster kidneys.

Upon detection of growth in culture mediums, subcultures were made in Stuart's liquid medium with rabbit serum enrichment, Fletcher's semisolid medium with rabbit serum enrichment, and the medium supporting growth upon initial isolation. Subsequent transfers were made in liquid Stuart's medium until an antigen of sufficient density was obtained. Hyperimmune serum samples against known strains of leptospirae were prepared. In the case of each isolate prepared as an antigen, a microscopic-agglutination test was conducted, testing the isolate antigen against hyperimmune typing serums.

Surface waters on the premise were cultured using a method previously described.[5]

Results

Microscopic-agglutination test titers of serum samples from cow 318 and from 10 steers on the same premise are shown (Table 1). All had *L. icterohaemorrhagiae* and *L. sejroe* titers ranging from 1:100 to 1:1,600. In 2 steers, titers of 1:1,600 were present for both serotypes.

Leptospires were demonstrated by direct microscopic examination of hamster kidney material from the first hamster passage of urine obtained from cow 318. Leptospires were isolated in culture mediums inoculated with kidney material from the sixth hamster passage. Only Chang's medium with rabbit serum enrichment supported growth on primary isolation. The isolate was then adapted to liquid Stuart's medium, prepared as an antigen, and serologically identified as *L. hardjo*.

A total of 101 wildlife specimens were collected. Distribution of species obtained and number yielding leptospiral isolates is indicated (Table 2). Out of 12 species represented, six (raccoon, opossum, skunk, muskrat, common mouse, and gray fox) yielded a total of 11 isolates.

Identification of individual isolates, mediums supporting growth of primary isolates, and serologic reactions of host animals are listed (Table 3). *Leptospira icterohaemorrhagiae* was isolated from 5 raccoons, 1 muskrat, 1 mouse, and 1 gray fox; *L. ballum* was isolated from 1 opossum; and *L. pomona* was isolated from 1 skunk.

No isolations were obtained from surface waters.

‡Alcoholic Roccal Solution, Winthrop Laboratories, New York, N. Y.

TABLE 2—Wildlife from a Pennsylvania Farm Indicating Species, Numbers Trapped, and Numbers Culturally Positive for Leptospires

Species	No. trapped	No. culturally positive
Vole (Microtus pennsylvanicus)	27	0
Raccoon (Procyon lotor)	16	5
Woodchuck (Marmota monax)	12	0
Opossum (Didelphis virginiana)	12	1
Chipmunk (Tamias striatus)	10	0
Feral cat (Felis domesticus)	6	0
Skunk (Mephitis mephitis)	5	1
Muskrat (Ondatra zibethicus)	4	1
Shrew (Blarina bravicauda)	4	0
Common mouse (Mus musculus)	3	2
Gray fox (Urocyon cinereoargenteus)	1	1
Red fox (Vulpes fulva)	1	0

Discussion

This is believed to be the second report of bovine leptospirosis due to *L. hardjo* in the United States.[9] The *L. sejroe* titer (Table 1; cow 318) was undoubtedly due to *L. hardjo* infection as these two members of the *L. hebdomadis* serogroup cross-react almost completely.

Taken together, the isolation of *L. hardjo* from cow 318, the isolation of *L. icterohaemorrhagiae* from eight wildlife hosts trapped on the premise (Table 3), and the serologic pattern observed in the cattle (Table 1) suggest that the herd had had a multiple serotype infection. Since, in our experience, animals yielding *L. hardjo* isolates do not develop *L. icterohaemorrhagiae* titers, it is tempting to speculate on the possibility of simultaneous infection with these two serotypes.

The isolation of *L. icterohaemorrhagiae*

TABLE 3—Identification of Individual Leptospiral Isolates from Wildlife; Mediums Supporting Growth of Primary Isolates and Serologic Reactions (Microscopic-Agglutination Test) Are Indicated

Host	Serotype isolated	Mediums	Aggultination titer
Raccoon 76	L. icterohaemorrhagiae	FR,CR,CH*	L. icterohaemorrhagiae 1:400
Raccoon 77	L. icterohaemorrhagiae	FR,CH	L. icterohaemorrhagiae 1:6,400
Raccoon 80	L. icterohaemorrhagiae	FR,FH,**CH	L. icterohaemorrhagiae 1:400
Raccoon 83	L. icterohaemorrhagiae	FH	L. icterohaemorrhagiae 1:400
Raccoon 87	L. icterohaemorrhagiae	FH	Negative
Opossum 119	L. ballum	FH,CH,SSS†	Negative
Skunk 28	L. pomona	FH	Not tested
Muskrat 11	L. icterohaemorrhagiae	FH	Negative
Mouse 260	L. icterohaemorrhagiae	FR	Not tested
Gray Fox 38	L. icterohaemorrhagiae	FH,CH	L. icterohaemorrhagiae 1:100

*FR = Fletcher's medium, rabbit serum; CR = Chang's medium, rabbit serum; CH = Chang's medium, horse serum. **FH = Fletcher's medium, horse serum. †SSS = Stuart's semisolid medium, rabbit serum.

from a muskrat (*Ondatra zibethicus*),[4] a gray fox (*Urocyon cinereoargenteus*),[3] a raccoon (*Procyon lotor*),[3] and a common mouse (*Mus musculus*)* established four new hosts for this serotype in the United States.

Many workers have questioned the value of animal inoculation for isolation of leptospires. In this (cow 318) and in other instances, omission of animal inoculation procedures would have resulted in failure to make isolations. The importance of employing a variety of culture mediums is likewise evident. Whereas Fletcher's medium with rabbit serum is most often preferred for routine use, only five of 11 wildlife isolates (Table 3) grew in this medium on primary isolation. In the case of cow 318, only Chang's medium with rabbit serum sustained the primary isolate.

Epizootiologic investigations of leptospirosis based solely upon serologic procedures are unreliable. In this study, three wildlife hosts yielding isolates were serologically negative (Table 3). Serologic responses, as in the case of cow 318, are difficult to interpret; positive statements concerning infecting serotypes cannot be made unless isolates have been obtained. Finally, an adequate test antigen bank must be available. Screening procedures utilizing only *L. pomona* or *L. pomona* plus *L. canicola* and *L. icterohaemorrhagiae* will not detect infection by members of the *L. hebdomadis* serogroup.

Summary and Conclusions

Epizootiologic studies of leptospirosis conducted on a Pennsylvania farm suggest that the cattle herd had a simultaneous infection with *Leptospira hardjo* and *L. icterohaemorrhagiae*.

Isolation of *L. hardjo* from a cow is believed to be the second such report in the United States; isolation of *L. icterohaemorrhagiae* from a common mouse is reported for the first time.

Animal inoculation techniques appear to be essential in field isolation attempts from cattle if some leptospiral infections are not to be missed. Epizootiologic investigations based upon serologic procedures alone are unreliable.

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*First report.

Bacteriologic and Serologic Investigations of Brucellosis and Leptospirosis in Illinois Deer

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THE ROLE of the white-tailed deer (*Dama virginiana*, Zimmerman) in the epizootiology of brucellosis and leptospirosis has yet to be clearly defined. Only a fraction of the amount of serologic and other work done on leptospiral infections in livestock has been done on deer. Nearly all serologic work reported has been done with *Leptospira pomona* antigen on relatively small numbers of serum samples.[1,14,16,18] Experimental investigations of both brucellosis[20] and leptospirosis[4] in deer have been reported, but there have been no large scale bacteriologic investigations of the natural diseases. Only one isolation of a leptospire from a wild deer is known, this being *L. pomona* from a deer in New York.[13]

This report concerns a three-year serologic investigation of brucellosis and a three-year bacteriologic and serologic investigation of leptospirosis in a large sample of deer, following a preliminary survey in 1957.[3]

Materials and Methods

Methods used in 1957, previously described, were modified, and bacteriologic as well as serologic techniques were used during the three-day deer hunting seasons of 1958, 1959, and 1960. Except for the addition of a few more counties in 1959 and 1960 (which added few deer), the same areas were included each year. Deer check stations were provided for each open county. All hunters were required to check the deer in at the stations where the carcasses were examined, records and specimens collected, and the hunter's permit inspected. Such data as the weight, sex, estimated age, and condition of the animals were recorded. At some stations, such specimens as eyes and jaws were taken from the deer.

In 1958, 1959, and 1960, check station personnel included six senior staff members of the College of Veterinary Medicine and 15 to 20 junior or senior students. Observations on the gross pathologic findings of the deer were made, and tissue samples were collected for histologic work where evidence of disease was present.

In 1958, approximately 4,000 blood collection tubes were mailed to the hunters of Ogle and Pope counties as an experiment in large scale sampling. Approximately half of the hunters in each county were reached. The hunters were instructed to take the blood at the time the deer's throat was cut, or from the heart if the deer was exsanguinated. Plastic, semen-sample tubes and standard, blood-sample tubes in specially designed cardboard containers were utilized.* Since the blood tubes were returned by hunters to the check stations, there was no need to utilize the more expensive mailers designed for filled blood tubes which, if broken, might constitute a health hazard.

The success of this procedure, which resulted in the receipt of approximately 250 blood samples from hunters, encouraged a new approach in 1959. Plans were made with the State Department of Conservation to attempt the collection of blood samples from all deer killed in order to obtain a more significant pattern of brucellosis and leptospirosis infection in deer. Plastic blood tubes and blood collection instructions were included in the envelope containing the deer permit sent to each hunter. A publicity and educational program involving conservation groups, sportsmen's clubs, newspapers, radio, and television was inaugurated. It was estimated that the kill would be about 2,500 deer. Although in previous years there was some selection by the hunters in

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*Any newly designed mailer for a glass tube should be approved by the Post Office Department in Washington, D.C.; it was found in this investigation that approval by one postmaster was no guarantee of concurrence by other postmasters. Some postmasters refused to accept the new mailers.

TABLE 1—Reactor Rates in Illinois Deer Serum Samples to Six Leptospiral Serotypes at Microscopic-Agglutination Test Titers of 1:200 or Above

Year	No. deer killed	No. serum samples tested	Kill tested (%)	Serum samples positive by serotype: L. p.* (No.)	(%)	L. g. (No.)	(%)	L. b. (No.)	(%)	L. i. (No.)	(%)	L. s. (No.)	(%)	L. c. (No.)	(%)	Total No.	Average (%)
1958	2,646	728	27.51	91	12.50	85	11.67	10	1.37	4	0.55	3	0.41	2	0.27	205	28.15
1959	2,648	2,260	85.30	146	6.46	124	5.49	16	0.71	0	....	15	0.66	2	0.09	303	13.40
1960	2,444	685	28.02	18	2.63	15	2.19	25	3.65	0	....	7	1.02	12	1.75	77	11.24
Totals and averages	7,738	3,673	47.47	255	6.94	224	6.09	51	1.38	4	0.11	25	0.69	16	0.43	585	15.92

*L. p.—L. pomona; L. g.—L. grippotyphosa; L. b.—L. ballum; L. i.—L. icterohaemorrhagiae; L. s.—L. sejroe; L. c.—L. canicola.

favor of the older males, a good cross section of all ages of deer, including fawns, was obtained. Blood samples from approximately 10% of the deer population were anticipated.

In 1958, 1959, and 1960, bacteriologic cultures were made for the isolation of leptospires from deer kidneys. The low reactor rates for brucellosis antibodies found in other investigations[16-18] and from our own work[4] as well as information from an experimental study[20] made efforts to isolate *Brucella* organisms impractical; therefore, no attempts to isolate *Brucella* organisms were made. Leptospiral isolation techniques and serologic methods for both organisms have been described.[2-5] Due to the unavoidable contamination of deer kidneys during collection in the field, the original methods were modified by searing the kidney surface with a propane torch flame before removing a section for trituration. Another modification consisted of the substitution of rabbit serum for horse serum in Stuart's medium.

In 1958, nearly all blood samples were sent by courier or bus to the College of Veterinary Medicine for processing at the end of the three-day season. Since about one fourth of the specimens were hemolyzed or otherwise unfit for processing during the first two seasons, another method was used in 1959 and 1960. Four field centrifuging stations were established to which blood samples were brought each day. Over half of the specimens were centrifuged and the serum samples removed by pipette in these stations; the rest were kept refrigerated and returned as rapidly as possible to the central laboratory, where they were processed the day after the deer season.

Microscopic-agglutination tests were performed with the following live antigens: *L. pomona, L. icterohaemorrhagiae, L. ballum, L. grippotyphosa, L. sejroe, L. canicola,* and *L. hyos.* The blood titers

TABLE 2—Deer Serum Samples with Two or More Titers at Dilutions Shown

Year	No. of individual serum samples	L. p.* 1:20	L. p.* 1:200 (or higher)	L. g. 1:20	L. g. 1:200 (or higher)	L. c. 1:20	L. c. 1:200 (or higher)	L. i. 1:20	L. i. 1:200 (or higher)	L. b. 1:20	L. b. 1:200 (or higher)	L. s. 1:20	L. s. 1:200 (or higher)
1958	4	x	..	..	x	..	..	..	..	..	..	..	..
	2	..	x	x	..	..	..	..	..	..	..	..	..
	1	..	x	..	..	..	..	..	..	..	..	..	x**
	1	..	..	x	..	..	..	..	..	..	x	..	..
	1	..	..	..	..	x	..	..	..	..	x	..	..
	1	..	..	x	..	..	..	..	..	..	..	..	x
	1	x	..	x	..	..	..	..	..	..	..	..	..
	1	..	..	..	..	x	..	..	x	..	..	..	..
	1	..	..	..	..	..	x	x	..	..	x	..	**
	1	..	..	..	..	x	..	x	..	..	..	..	..
	1	x	..	..	..	x	..	..	..	..	..	..	..
1959	2	..	x	x	..	..	..	..	..	..	..	..	..
	1	..	x	x	..	..	..	..	..	x	..	..	..
1960	1	..	..	..	..	..	x	x	..	..	..	x	..
	2	..	..	x	..	..	..	..	..	x	..	..	..
	1	x	..	..	..	..	..	..	..	x	..	..	..
	1	..	..	..	..	..	..	..	..	..	x	..	x**
	1	..	x	x	..	..	..	..	..	x	..	..	..
	1	x	..	x	..	..	..	..	..	..	..	..	..
	1	x	..	..	..	..	x	..	..	..	..	..	..
	1	..	..	..	..	x	..	..	..	x	..	..	..
	1	..	..	..	..	..	x	..	..	..	..	..	x**
	1	..	..	x	..	x	..	..	..	..	..	..	..
	1	x	..	x	..	x	..	..	..	..	..	..	..
Total	32	..	..	..	..	..	..	..	..	..	..	..	..

*L. p. = L. pomona; L. g. = L. grippotyphosa; L. c. = L. canicola; L. i. = L. icterohemorrhagiae; L. b. = L. ballum; L. s. = L. sejroe. **Cross titers at 1:200 or above.

of deer which had been inoculated experimentally with *L. pomona*[3] were examined periodically for more than a year.

Results

Over 4,000 deer serum samples were collected between 1958 and 1960. Approximately 61% of the serum collected in 1958, 91% in 1959, and 90% in 1960 were satisfactory for testing. A total of 3,673 deer serum samples were tested between 1958 and 1960, representing 47.5% of the deer killed during the hunting seasons (Table 1). An average of 15.92% of the total reacted to one or more serotypes at the 1:200 dilution. There was some year-to-year variation: 28.15% reacted in 1958, 13.40% in 1959, and 11.24% in 1960. The largest percentage of serum samples was positive to *L. pomona* (6.94%) and *L. grippotyphosa* (6.09%) antigens. The third highest reaction was to *L. ballum* (1.38%). Reactors to

Fig. 1—Counties which had deer that reacted to six leptospiral serotypes. Heavy black lines enclose counties in which hunting was permitted.

Fig. 2—Counties in which deer had titers to *Brucella* are darkened on the map. Heavy black lines enclose counties in which deer hunting was permitted.

L. sejroe, *L. icterohaemorrhagiae*, and *L. canicola* were present in still smaller numbers. One reactor to *L. hyos* at the 1:200 dilution was found in 1960.

Counties having reactors to all serotypes over the 3-year period are shown (Fig. 1). In 1959 a sample comprising approximately 50 to 100% of the total number of deer killed was obtained from 19 counties. (Of the 2,260 samples tested, about 200 were not properly labeled and could not be identified by county.)

A compilation of all cross reactions in individual serums from 1958 to 1960 is given (Table 2). Only 4 samples or 0.1% of 3,673 had cross reactions at significant levels. Another 28 or 0.7% had cross reactions at the 1:20 dilution with one or more antigens. There were no cross reactions at the 1:200 dilution among the 2,260 samples collected in 1959 and only 3 cross reactions at any level in this collection. There were no cross reactions at significant levels between *L. pomona* and *L. grippotyphosa*, the two most numerous serotypes.

No leptospires were isolated from a total of more than 500 kidney triturates obtained in nearly equal numbers in 1958, 1959, and 1960 from the Dixon Springs check station in southern Illinois and the Sinnissippi Forest check station in northern Illinois.

During the three-year investigation, eight reactors to *Brucella abortus* antigen were found, one in 1958, and seven in 1959. The geographical distribution of the reactors is shown (Fig. 2).

Discussion

The distribution of various serotypes throughout the regions of the state was fairly uniform. All seven of the northern counties had reactors to one or more serotypes. Only nine of the 17 west central counties had reactors, but a much smaller number of serum samples were collected from these counties. All but one of the 11 southern counties had reactors, perhaps as a result of the larger numbers of serum samples which were collected from these counties.

Although questions regarding the organisms causing the agglutination reactions in this investigation cannot be answered in a definitive way, in the absence of leptospiral isolations some conclusions may be warranted. Previously reported experiments have shown that, in deer, titers to *L. pomona* as high as 1:10,000 may persist longer than three months.[4] Significant titers in these and other deer persisted for over a year; the titers in 4 of 6 deer fell to 1:20, whereas two remained as high as 1:200. There were no significant cross reactions with any of the antigens used in this investigation in a total of 10 deer inoculated experimentally and their titers followed for several months to over a year. Cross reactions among *L. pomona*, *L. icterohaemorrhagiae*, and *L. canicola* in dogs have been found, particularly when the macroscopic-agglutination test has been used.[2,8] In pig serum samples in Scotland, there were cross reactions to *L. icterohaemorrhagiae* and *L. canicola* but not *L. grippotyphosa* or *L. hyos*, even at low dilutions.[10] The two cross reactions previously reported[3] were not at significant levels. A record of all cross reactions found since 1957 including additional serum samples from road kills and other deer besides those investigated during the hunting seasons is presented (Table 2). In a total of over 4,000 deer serum samples examined by the microscopic-agglutination test, only four cross reactions at significant levels have been encountered.

Earlier reports of leptospiral antibodies in deer serum samples dealt with *L. pomona*.[1,16-18] Preliminary work in Illinois in 1957 revealed titers to both *L. pomona* and *L. grippotyphosa* in approximately equal ratios.[3] The same approximate proportion of positives for these two serotypes was maintained in the larger collection in 1958 and in the much larger one in 1959. The finding of a nearly equal ratio of *L. grippotyphosa* and *L. pomona* antibodies needs further investigation. *Leptospira pomona* has been found to be the major serotype infecting livestock in the United States; *L. pomona* in deer might, therefore, be explained in terms of a livestock reservoir. This explanation probably cannot hold for *L. grippotyphosa*. The titers to both *L. pomona* and *L. grippotyphosa* had very similar patterns; over 80% of both were at or above 1:1,000. The number and proportion of so-called "nonspecific" titers (1:20) was about the same for both also. This finding argues against considering the reactions to *L. grippotyphosa* as nonspecific. Reactors to *L. grippotyphosa* have been found in livestock as well as in rodents in Illinois.[5,7]

No evidence was found that *L. pomona* infection in deer can initiate a heterologous reaction to *L. grippotyphosa*. Although it is possible that these titers are the result of infection with a nonleptospiral or otherwise nonspecific organism it seems much more probable that the experience with *L. sejroe* may have been repeated. In that circumstance, a closely related serotype (*L. hardjo*) was finally isolated from cattle.[15] Incidence of *L. pomona* reactors in Illinois cattle of 19.7% in 1952 and 1953, 24.0% in 1955, and 18.5% in 1957 has been reported.[7] Numbers of cattle used in these surveys varied from 12,622 to 26,376. About 24.0% of 11,717 swine in 1955 and 9.2% of 18,746 swine in 1957 were found to be reactors. The percentage of reactors to *L. pomona* was three or four times higher in cattle and swine than in deer, except for the swine rate of 1957, which was close to the deer rate. Reactor rates of deer to *L. grippotyphosa*, on the other hand, were higher in deer than in cattle or swine in 1957, 1958, and 1959, although about the same as those of cattle in 1960. Reactor

rates for this serotype in deer were only slightly lower than those for *L. pomona*, while the *L. grippotyphosa* reactors in Illinois cattle and swine in 1957 were only 1.9% and 0.9%, respectively, (at titers of 1:100 or higher).[7] The over-all differences in the reactor rates suggest the possibility that the reservoir for *L. grippotyphosa* may be in wildlife. Although the total number of livestock reactors to *L. grippotyphosa* is low as compared to *L. pomona*, individual swine and cattle herds with a high proportion of *L. grippotyphosa* infections have been encountered in Illinois. Further work on the reservoir and infection chains of the causative organism is obviously needed.

Failure to isolate leptospires from the kidneys of more than 500 deer in addition to evidence from the previous experimental work[4] makes it improbable that deer are now an important reservoir of leptospirosis for livestock or man in Illinois. This investigation suggests even more strongly that deer are not spreading brucellosis in Illinois under present circumstances.

Summary

During the three-year period from 1958 to 1960, 3,673 deer serum samples collected in Illinois from 47.5% of the deer killed during the hunting seasons were tested by the plate-agglutination test for brucellosis reactors and by the microscopic-agglutination test for leptospirosis reactors. At the 1:200 dilution, 6.94% were positive to *L. pomona*, 6.09% to *L. grippotyphosa*, 1.38% to *L. ballum;* a few reactors to *L. sejroe, L. icterohaemorrhagiae, L. canicolâ*, and *L. hyos* were also found. Titers of deer inoculated experimentally were found to remain at levels of 1:20 to 1:200 for more than a year.

Tissues from over 500 deer were examined by bacteriologic and pathologic methods. No leptospires were isolated, and no evidence of residual kidney damage was found.

Only one brucellosis reactor in 1958 and 7 in 1959 were found.

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Bordetella bronchiseptica (Brucella bronchiseptica) in Pneumonia in Young Pigs

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FOUR PIGS, 3 weeks old, were examined at necropsy at our diagnostic laboratory with a history of chronic coughing and cachexia. Similar clinical signs were first observed in this herd several months earlier in litters from sows that had been purchased as bred gilts through a community auction. The sows were reportedly first generation progeny of breeding stock imported from Canada.

The baby pigs began coughing when about 10 days old. There was no other sign of illness except cachexia. Losses within litters varied up to 100%. The total loss was approximately 60%. At the second farrowing, the disease again occurred in 10-day-old pigs, and losses were equally as heavy as in the earlier instance. There had been no vaccinations. Sows appeared normal and had no record of recent illness. Both sows and baby pigs had access to adequate pasture. Body temperatures of baby pigs ranged from 102 to 104 F.

Necrospy Findings

The primary lesions were scattered areas of bronchopneumonia, predominant in the apical and cardiac lobes but also in the dorsal aspects of the lung. The patchy distribution of lesions appeared to be characteristic (Fig. 1). All pigs had facial abrasions or teeth marks apparently from fighting. The sharp canine teeth had not been clipped. Other less constant lesions included congestion of nasal sinuses, congestion of mesenteric vessels, slight enlargement of the spleen, and some emphysema of the lungs. Hematologic studies were inconclusive. On histopathologic examination, a marked congestion of the lungs with severe perivascular, interstitial, and intra-alveolar hemorrhage was found (Fig. 2). In some areas, there was an acute inflammatory reaction with heavy infiltration of neutrophils (Fig. 3). In other sections of the lung, lesions appeared to be of longer duration with an excess of fibroblastic elements and macrophages. Many macrophages could be found in the alveoli in these areas. There was a pronounced interlobular edema of the lung which appeared to be characteristic of the disease (Fig. 3). On microscopic

Fig. 1—Dorsal and medial view of lungs from a pig infected with *B. bronchiseptica*. Patchy bronchopneumonia is characteristic.

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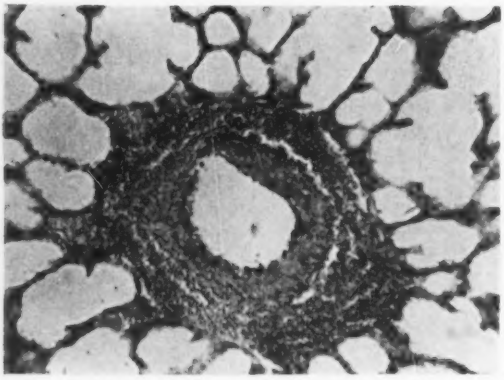

Fig. 2—Periarterial hemorrhage involving a small vessel in an acutely infected portion of the lung. H & E stain; x 135.

examination, both brain and liver were congested. There was also congestion in the small and large intestines.

From a bacterial culture of the lungs of all 4 pigs and the nasal sinus of 1, pure cultures of *Bordetella bronchiseptica* (*Brucella bronchiseptica*) were obtained.

The organism was a *beta*-hemolytic, gram-negative, motile rod. It produced marked alkalinity in litmus milk, utilized citrate, split urea, and was catalase-positive. It did not attack carbohydrates, produce indole, reduce nitrates, liquify gelatin, or produce hydrogen sulfide.

Discussion

The lesions in these pigs appeared to differ from those commonly ascribed to virus pneumonia since they were not limited to the apical and cardiac lobes and occurred in patchy areas and not as a uniform involvement in a lobe or area.

In at least one previous report,[2] *B. bronchiseptica* has been associated with chronic pneumonia in swine. The organism was isolated from young pigs in eight Ontario piggeries which appeared to be under ideal management. The only clinical history provided was chronic coughing, unthriftiness, and fluctuating mortality. In each instance, *B. bronchiseptica* was isolated in pure culture from the viscous bronchial exudate of a consolidated portion of the lung. The pathologic changes were not given. The organism, however, was highly pathogenic for guinea pigs. The authors proposed that this organism be included in the group of pathogens causing chronic pneumonia reportedly so common in Ontario piggeries at that time.

There is every reason to believe that *B. bronchiseptica* could be a pathogen capable of causing bronchopneumonia in swine. The point in question is whether the organism is a primary pathogen or whether it accentuates an existing condition such as virus pneumonia.

Although it was impossible to make a

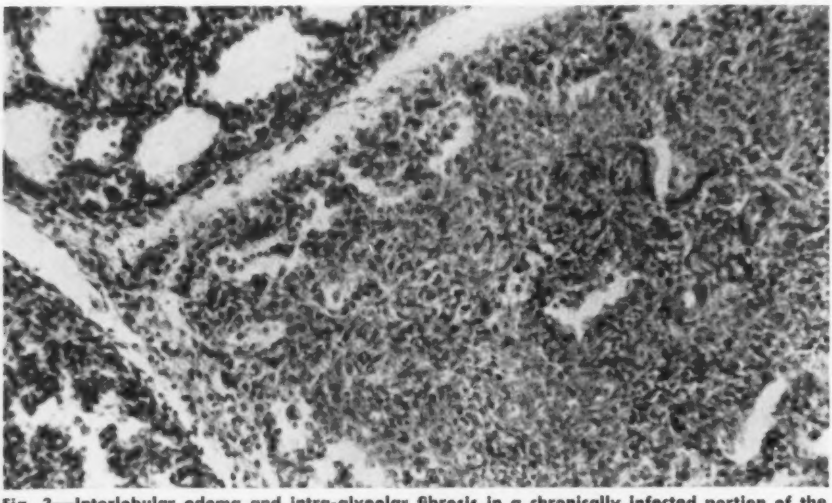

Fig. 3—Interlobular edema and intra-alveolar fibrosis in a chronically infected portion of the lung. Neutrophils infiltrate adjoining alveoli. H & E stain; x 48.

definite statement at the writing of this report, we can postulate that most bacterial infections are at least accentuated by previous, concurrent, or postinfection exposures to pathogenic viruses. With the recognized prevalence of virus pneumonia, it seems quite likely that a concurrent infection may have accounted for the severity of the disease. However, we must be alerted to the possibility that all baby-pig pneumonias may not be of viral origin and that other stress factors may be predisposing to primary infection by bacteria.

The pathogenicity of *B. bronchiseptica* for some species has been well-established. It has been known to cause severe endemic pneumonia in laboratory animal colonies.[1] We, too, have isolated the organism from guinea pigs in establishments where pneumonia was rampant. It is recognized for its role as a secondary invader in canine distemper, but it has also been shown to be capable of causing severe respiratory infections in the dog in the absence of virus.[1] One investigator has shown that atrophic rhinitis can be caused experimentally by *B. bronchiseptica*.

Although reports of *B. bronchiseptica* infection in swine in the United States appear to be lacking, the disease apparently has been recognized here.[3] The organism was described as a common cause of a chronic degenerative type of edema of the lungs of swine. Recovered gilts appeared to be carriers and infected their litters. Infection began when baby pigs were 3 to 4 days old and was characterized by a whooping cough. The term "porcine whooping cough" was proposed because the organism cross-immunized with *Hemophilus pertussis*. The disease caused trouble in feeder-type pigs but was less common in older swine, and the organism was reported to persist on the premises and to plague one pig crop after another with a chronic respiratory infection. Bacterins commonly prepared for use in dogs were effective in preventing the disease. Therapeutically, broad-spectrum antibiotics, particularly those effective against gram-negative organisms, were used with some success.

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Transfusion Reactions in Horses

In the horse, the first signs of a transfusion reaction are flexing of each of the hind limbs in turn and an increase in the respiration rate accompanied by flaring of the nostrils. The horse often holds its head down, sometimes its breathing becomes noisy, and it may "yawn" several times. Breathing becomes more shallow and, in severe reactions, the horse tends to hold its breath at inspiration. Defecation and micturition will occur in severe reactions, and the horse may fall over. Dextran is not recommended for horses because severe reactions may result.

No more than 1 liter of blood should be given in a ten-minute period and, within practical limits, the slower the infusion the better.—*Vet. Rec., 73, (July 8, 1961)*: *658*.

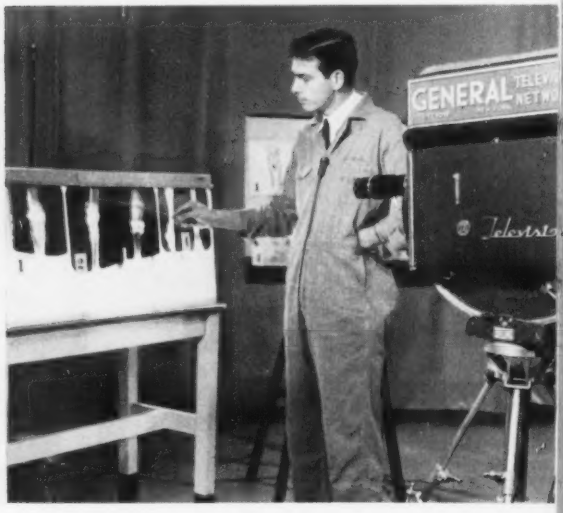
T. N. Philips, Urbana, Ill., showed how uncontaminated samples of bacteria could be obtained from the genital tract of the mare. A sterile glass speculum was employed.

Television Highlights in Detroit

With the 98th Annual Meeting in Detroit, the AVMA has conducted its eleventh consecutive year of closed-circuit educational television. Television expenses for all these years were underwritten largely by Pitman-Moore Company. The programs have been coordinated and directed for ten years voluntarily by small animal practitioner L. E. (Les) Fisher of Berwyn, Ill.

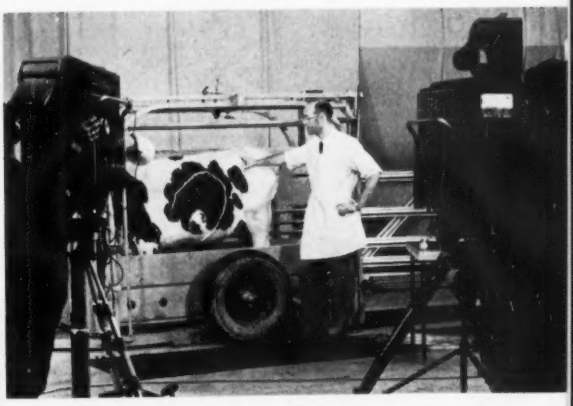
This year the TV program was split into three sections; one dealing with horses, one with cattle, and the other with pet animals. There were 16 participants, 9 of whom were practitioners. The experienced TV crew in Detroit performed ably, making one of the best television performances ever given at an AVMA Annual Meeting. All equipment and animals were supplied by local committeemen, Dr. C. P. Hodder, Detroit, and Dr. D. J. Ellis, East Lansing, Mich. and their assistants.

Above, R. W. Van Pelt, East Lansing, described and demonstrated intra-articular injection of the carpus and fetlock of the horse. Use of drawings and radiographs (right) made demonstration especially vivid. All demonstration horses were shod with rubber shoes to prevent slipping on the smooth concrete floor of the TV studio in Cobo Hall.



Above, W. L. Stroup, Corinth, Miss., demonstrated various physical restraint techniques for horses. He stated that physical restraint of horses is becoming a lost art, since the advent of newer chemical restraints. Dr. Stroup gave his several demonstration lariats and halters to persons in the audience at the close of his performance.

Below, the ear twitch is being demonstrated in a close-up view.

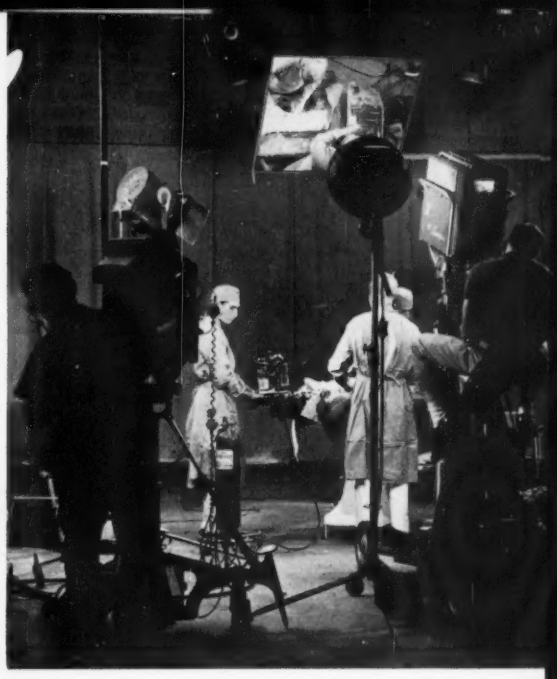


M. P. Rines, East Lansing, Mich., discussed diagnosis of abomasal displacement in cattle. Using a plasticized model ruminant stomach, drawings, a tape recording of stomach sounds, test equipment, and a live cow, he demonstrated methods of confirming diagnoses. Outline of displaced abomasum on side of demonstration cow was made with shaving cream.

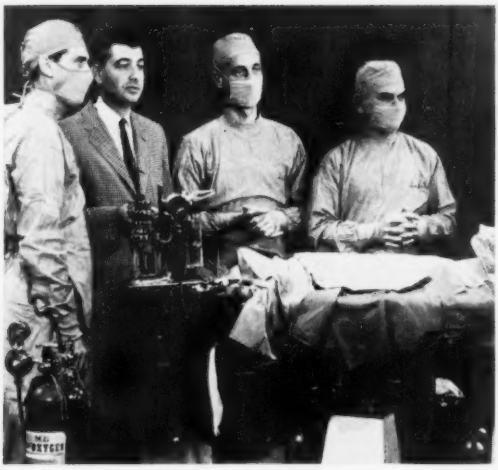
W. D. Pounden, Wooster, Ohio, demonstrated the technique of rumen lavage in cattle. About 25 gallons of water are pumped or poured through a large semirigid stomach tube and then the stomach is allowed to empty. The technique is useful in treatment of bloat and other digestive disorders. Wash tub was used to catch emptying ruminal contents.

C. C. Beck, East Lansing, Mich., demonstrated techniques for collecting blood samples from the caudal veins of cattle. Small gauge bleeding needles were considered necessary to minimize trauma to the vein. Disposable syringes were cited as a practical means for collecting blood in this manner.

A. F. Hentschl, Harbor Beach, Mich., performed a technique for correction of vaginal prolapse in which large, overcoat-type buttons were used to anchor the sutures. Using local anesthesia, the technique is virtually painless. Button is visible on dorsum of gluteal region.

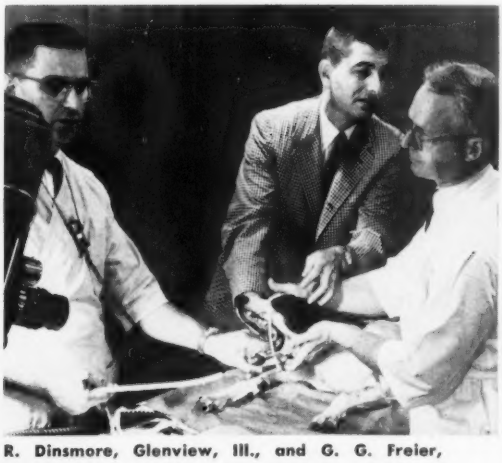


Batteries of cameras and lights indicate intense activity of telecasting. Slanted overhead mirror permitted unobstructed close-ups. Microphones concealed under surgical garb enabled all participants to describe and discuss procedures. Small animal portion of TV program was videotaped for future showings to local groups.



Surgeons T. H. Brasmer, Danville, Ill., and R. G. Schirmer, East Lansing, Mich., with clasped hands stand ready while moderator Les Fisher introduces demonstration of intrathoracic surgical technique.

W. F. Keller, East Lansing, Mich., demonstrated a method for correcting surgically faulty ear carriage in erect-eared dogs. Technique required that an elliptical piece of skin be removed from the base of the ear and that sutures to hold auricular cartilage to fascia on the head be applied.



R. Dinsmore, Glenview, Ill., and G. G. Freier, Benton Harbor, Mich., demonstrated methods of examining the upper respiratory tract of the dog and how to institute ventilation procedures. TV camera lens was pushed almost into dog's mouth to give viewers a detailed close-up view of pharyngeal and laryngeal structures and the tracheal tube.

Failure of Stainless Steel Intramedullary Pins due to Breakage

William J. Kelber, D.V.M., and George J. Charlebois, D.V.M.

VETERINARIANS who engage in orthopedic surgery should beware of inferior-grade stainless steel intramedullary pins and should not take for granted that the strengths of all such pins are alike.

In one case, a pin broke into pieces while imbedded in the radius of a dog. In another, the pin broke on attempted removal. Subsequent analysis of one pin proved that it was of substandard quality (Table 1). Our supplier had substituted an inferior-grade pin. The substandard pins were electro-etched at the factory to indicate their size in the same manner as acceptable quality pins were. Since manufacturers' names do not appear on pins, they cannot be differentiated by casual observation.

Case Reports

Dog 1.—On April 23, 1960, a 4.5-lb. male Toy Poodle, 7 months old, was presented for examination with radial-ulnar fractures at approximately the middle of the foreleg. The owner insisted on a method of fracture repair that would assure the dog a straight leg upon healing. The owner, because of an unsatisfactory previous experience, did not want a conventional external cast applied.

Using standard preoperative procedures and pentobarbital sodium as an anesthetic, a 2-inch incision was made medially over the fractured radius. The proximal portion of the radius had an intramedullary canal so small that a threaded pin, 1/16 inches in diameter, could barely be inserted. The pin was worked up and through the humeroradial joint. Even in a young dog, the bones of this joint are dense and difficult to penetrate. The lower end of the pin was anchored in the distal half of the radius. The fractured ulna was aligned, and the wound was closed by standard operational procedure. A Kirschner-Thomas splint was applied for extra protection, radiographs were again taken (Fig. 1), and antibiotics administered. Skin sutures were removed on postoperative day 5, and the external splint was removed 3 weeks later. The leg was radiographed 4 and 6 weeks postoperatively. On the 4-week radiograph (Fig. 2), cracking at the proximal end of the pin was detected (Fig. 3). By 6 weeks postoperatively, both fragments

Dr. Kelber is a small animal practitioner in Ontario, Calif., and Dr. Charlebois is a small animal practitioner in Claremont, Calif.

Legends for Fig. 1-6 on Opposite Page

Fig. 1—Intramedullary pin in place one day after fracture.

Fig. 2—At 4 weeks after pinning, excellent callus formation is evident. Proximal end of stainless steel pin is cracked.

Fig. 3—At 6 weeks after pinning, the proximal end of the broken pin is being removed. Distal end of pin does not interfere with movement of joint.

Fig. 4—Pin in place immediately following surgery with the proximal end of pin passing through olecranon. Humeroradial joint is not affected, and joint can flex during healing.

Fig. 5—At 8 weeks after pinning, healing is progressing satisfactorily.

Fig. 6—Only the proximal part of pin was removed because of breakage. Dog has full use of leg.

1

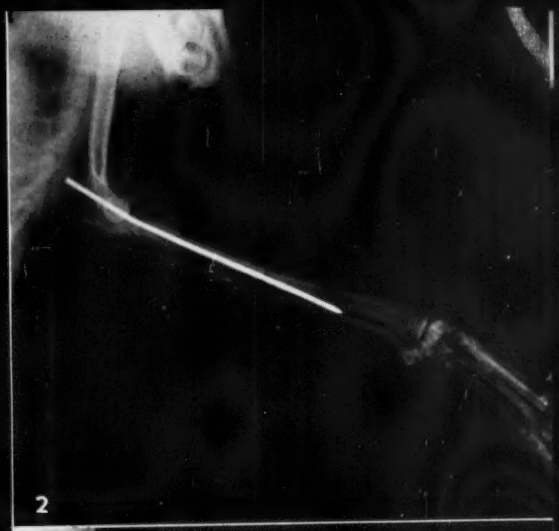


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TABLE 1—Laboratory Analysis and Chemical Composition of Stainless Steel Intramedullary Pins

Analysis	Standard pin*	Substandard pin
Rockwell hardness**	C52	C41†
Tensile strength‡	120,000 lb./sq.in	80,000 lb./sq in.
Tempering§	None	None
Modulus of elastiticy	29	Unknown
Elongation	50%	Unknown
Chemical composition:		
Carbon	0.08	0.09
Manganese	0.58	0.62
Sulfur	0.02	0.25
Silicon	0.09	0.60
Nickel	10.42	8.72
Chromium	17.63	18.36
Molybdenum	2.63	None‖

*Kirschner pin, Kirschner Manufacturing Co., Vashon, Wash.

**The Rockwell Hardness Tester measures hardness by determining the depth of penetration of a small steel ball into the specimen. A scale reads the depth of penetration; the higher the needle reads on the scale, the harder the material.

†A pin of C41 hardness is not considered satisfactory even for a standard type of intramedullary pin reduction.

‡In steels, hardness is directly related to the tensile strength.

§Neither pin was tempered since the carbon content is low. The hardness is achieved by cold working; the more the metal is cold worked, the harder the end product, up to a maximum point.

‖Notice that the inferior pin does not contain any molybdenum. Molybdenum is widely used to produce steel of greater tensile strength.

of the radius and ulna had united. Under thiopental anesthesia, the proximal end of the broken pin was removed. Fortunately the distal end of the pin did not interfere with normal joint movement. The piece of pin removed was sent to a manufacturer* of intramedullary pins for examination and explanation. After detailed laboratory analysis (Table 1), we learned that we had used an inferior-grade pin. Four months postoperatively, the dog walked normally with full joint mobility.

Dog 2.—Before the possibility of pin breakage was realized, the authors were called upon to pin another radial-ulnar fracture. Another inferior-grade pin was used inadvertently.

*Kirschner pin, Kirschner Manufacturing Co., Vashon, Wash.

On May 16, 1960, a 36-lb. female Afghan Hound, 14 months old, was presented for examination with the distal end of the radius and ulna at a 45 degree angle. Both the radius and ulna were fractured. Surgery was performed 24 hours after the injury. Although this was a large dog in height and bone length, the diameter of the radial intramedullary cavity was small. The largest pin that could be inserted was 0.08 inches in diameter. With a little more intramedullary space to work with than in the Toy Poodle, we were able to angle the proximal end of the pin toward the olecranon, thus bypassing the humeroradial joint entirely. The radial fragments were pinned, and the ulnar fragments were aligned. An external splint was also applied for 3 weeks. Radiographs were taken at 6 and 8 weeks, postoperatively (Fig. 4 and 5). We waited until 8 weeks had elapsed before removing the pin because of the stress involved with such a long-boned dog. Eight weeks after pinning and under light anesthesia, withdrawal of the pin from the intramedullary canal was started. This pin broke into 2 pieces approximately 2 inches from the proximal end when pressure was used to ease the pin past the callus. The elbow joint was radiographed after removal of the piece of the pin (Fig. 6).

Twelve weeks postoperatively, the dog walked well but with a pronounced limp; 4 months postoperatively, the gait was normal. The dog performed successfully in the show ring 8 months after surgery.

Summary

Intramedullary pins were used to immobilize fractures of the radius in 2 dogs. Complete removal of the pins was intended. Because of pin breakage due to inferior quality, the technique was not entirely successful. Fortunately, fracture repair was satisfactory and good functional use of the legs was restored in both patients. Inferior quality of one pin was determined by laboratory analysis.

Capillaria plica Infection in a Dog

William Medway, D.V.M., Ph.D., and Joseph F. Skelley, V.M.D.

BECAUSE OF the scarcity of reports in the literature, the incidence of *Capillaria plica* in the dog seems low. However, this may not be true, since some authorities[2] suggest that the incidence probably approaches 50% in the general dog population.

In many cases, the parasitic ova are probably overlooked during examination of the urinary sediment. There is also the possibility that occurrence of *C. plica* ova in the sediment of dog's urine is discounted because they resemble whipworm ova, which are sometimes present as a result of fecal contamination. In the case reported here, the referring veterinarian stated that whipworm-like ova were seen in the sediment and were thought to be the ova of *Dioctophyma renale*. The presence or absence of ova in the urine is not, *per se*, a reliable index of the true incidence of these worms in dogs.[2]

Case History

On June 5, 1960, a 3-year-old, female Beagle was referred to the University of Pennsylvania Veterinary Hospital for examination and confirmation of possible *D. renale* infection. There was persistence of red and white blood cells in the urinary sediment, and there were periodic signs of clinical cystitis. Since birth, the patient had been kept in a kennel with other dogs. The diet consisted of a commercial dry ration with some raw beef kidney, fat, cod liver oil, and B-complex vitamins. Vaccinations for distemper and hepatitis were completed at eight months of age. Since that time, the patient had been treated repeatedly for whipworm infections and cystitis. On three occasions when urinary sediment was examined, numerous white blood cells, red blood cells, and casts were seen. In addition, there was a record of numerous convulsions probably due to distemper.

A thorough examination of the dog confirmed only the presence of white blood cells, red blood cells, and ova of *C. plica* in the urinary sediment (Fig. 1).

An intravenous urogram was performed on the dog three days after admission. No visible abnormalities were seen in the urinary tract. The patient was discharged on June 13, 1960, without treatment.

Life Cycle of *Capillaria plica*

Capillaria plica (Rudolphi, 1819), a nematode belonging to the family *Trichuridae*, is a parasite that lives in the urinary passages of the dog, fox, and wolf. The fox is probably the main host. It is fragile, threadlike, yellowish, and difficult to see with the unaided eye. The male measures 13 to 15 mm. in length and the female 30 to 36 mm.[3] These measurements are somewhat shorter than those given by others.[4] The width varies from 0.048 to 0.090 mm.

The life cycle of *C. plica* is indirect, and the earthworm is the intermediate host. After ingestion of the infective ovum by the earthworm, the first larval stage slips out of its oval membrane, pierces the intestinal wall, and becomes encysted in the connective tissue near the intestinal canal. When the earthworm is ingested by a canine host the second larval stage develops within the wall of the host's small intestine and remains there for eight to ten days. The third larval stage then develops and migrates from the intestine to the bladder through the blood stream. The fourth larval stage and the mature worm develop within the bladder. In 2 foxes observed,[3] the period between the ingestion of the infected earthworms to the appearance of ova in the urine was 58 and 63 days.

When earthworms infected with *C. plica* were fed to young foxes, the first signs appeared in three to four days. The foxes were anorexic and had difficulty urinating. There was also slight leucocytosis and eosinophilia. *Capillaria plica* larvae were found in the blood stream of these experimentally infected foxes. Their growth was visibly impaired.

From the School of Veterinary Medicine, University of Pennsylvania, Philadelphia, where Dr. Skelley is an assistant professor in the Section of Medicine. Dr. Medway is now at the Ontario Veterinary College, Guelph.

The authors acknowledge the advice and encouragement of Dr. G. L. Graham, Parasitology Laboratory, and the photographic work of Mr. A. Marfaing, Wistar Institute.

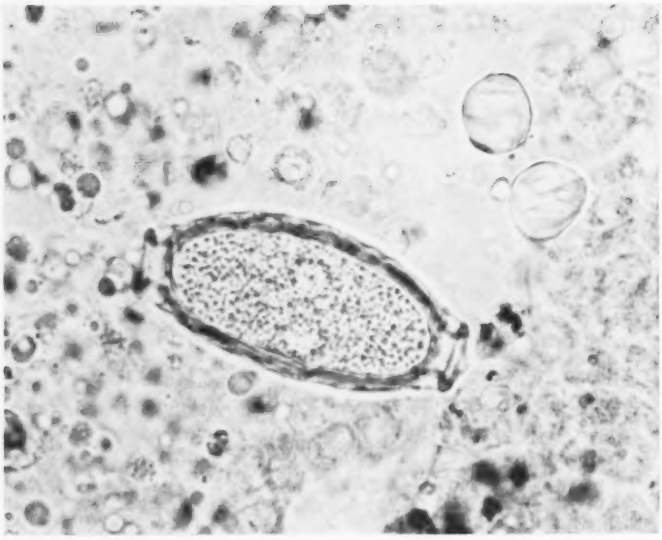

Fig. 1—Ovum of *C. plica* in the urinary sediment. The polar plugs, pronuclei, and details of the shell are shown. x 638.

Prenatal infections probably do not occur with *C. plica*.

Discussion

The distribution of capillarid worms in mammals in the United States, Europe, and other geographical areas has been reported in a comprehensive review.[3] There is some doubt as to whether *C. plica* is responsible for clinical signs associated with the urinary tract, although cystitis, difficulty in urination, and abnormality in mating procedures have been ascribed to the infection.[4,5]

Although the usual site of infection is the urinary bladder, worms have been found in the kidney.[4] Kidney infection must, however, be uncommon since a survey conducted in England revealed a 50% infection in a total of 168 necropsies on foxes; in none of these were the kidneys affected.[5]

As indicated above, an intravenous urogram was negative. A routine hemogram revealed no abnormality; however, the time of hematologic examination is undoubtedly important since the hematologic signs are probably present only when the parasite invades the intestine, the bladder, or both.

It is not known where or how the dog was infected. There were no signs of infection in other dogs in the kennel; however, the dog did participate in various shows where the infection may have been acquired.

No effective treatment for the parasites is known. Phenothiazine had no effect on the worms in the bladder of experimentally infected foxes.[1]

Summary

Capillaria plica (Rudolphi) infection in a dog was diagnosed. The presence of ova and blood cells in the urinary sediment and the persistence of cystitis were the only indications of infection.

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Zoning for a Small Animal Hospital

Alan C. Secord, B.V.S., M.Sc., D.V.Sc.

IT IS a well-known fact that about half the clients select a small animal hospital because of its convenient location. Therefore, it should be close to a good residential area, the citizens of which are financially able to pay for veterinary services. Sometimes a location off the main road, but close to a good residential area, is much better than one directly on a through highway where the traffic at certain times is so heavy that it is difficult for clients to get in and out of the parking lot. With today's automobile-dependent population, it is important to have an adequate and easily accessible parking area as well as a fine hospital.

Purchase of Property

Once an available piece of property in the right location has been decided upon, the veterinarian should buy it with the closure of the transaction subject to the issuance of a permit to erect a veterinary hospital at this location. It is not wise to complete the property transaction before obtaining the permit. Some veterinarians have large sums of money invested in real estate which cannot be used for its intended purpose because of their inability to obtain a permit. The permit should be obtained for the property itself rather than in an individual's name, since the original purchaser might not complete his plans to erect the hospital and want to resell it. The purchase of a piece of property, subject to obtaining a permit, immediately produces an active friend in the person of the vendor of the land, who will give interest and support.

Zoning Regulations

Most modern communities have a department of planning and development which administers stringent zoning regulations. In most instances, veterinary hospitals are listed as least desirable, or may not be mentioned at all. In order to obtain a permit, it may be necessary to get a specific amendment zoning the particular parcel of land for a veterinary hospital. Various officials should be approached by letter and in person, pointing out that a modern veterinary hospital, properly constructed, is entirely different from a boarding kennel and will be a credit rather than a nuisance to the community.

Neighbors

News about building permits travels quickly, and residential property owners near and far often become alarmed at the prospect of a nuisance neighbor. They imagine barking dogs, unpleasant odors, and other decidedly undesirable factors. If unchecked, delegations of irate citizens will reach the local council even before it has had time to consider the application.

Processing a zoning amendment requires several months' preparation and two or three public hearings at 30-day intervals. During this time, gaining the friendship of the people who will be your neighbors for the next 25 years is essential. A good foundation of neighborly respect established at this time is just as important as finding a good architect.

In our case, we called a public meeting of property owners and other interested parties within several blocks of the proposed site. This meeting was under the chairmanship of the vendor who, of course, was anxious to help secure the permit in order to complete his sale. The chairman pointed out that a veterinary hospital was needed in this new and growing community, that healthy animals are important to the good health of families, and that pets are a part of our way of life. Public health aspects enlarged upon included the veterinarian's role in the control of rabies, ring-

Dr. Secord is the owner of the Secord Animal Clinic, constructed in 1960 in an attractive residential area of Toronto, Ont.

worm, and other animal diseases communicable to man. The chairman also pointed out that if the permit were not granted he might be forced to sell the property to some other person who, according to the present zoning regulations, could erect a business that would be much more of a nuisance than a veterinary hospital.

I told them something of my background and schooling and of my ambition to erect and maintain a good veterinary hospital which would be a credit to the community; I pointed out that I, as a resident, would be proud to see high standards maintained in what would be my community as well as theirs. My architect then outlined tentative plans and features such as soundproofing, indoor runs, air-conditioning, and landscaping. A model of the hospital and location and some exterior drawings were available to those interested in seeing them. Several booklets describing veterinary hospitals and their zoning and the American Animal Hospital Association's volume, *Planning Your Animal Hospital,* were mentioned.

A question and answer period was held at the conclusion of the meeting, and it was evident that some resentment among the citizens still remained. They were then asked to appoint two of their group, to be taken to visit several modern, newly built, veterinary hospitals. In one instance, I flew them some 300 air miles to Cleveland to see a hospital* surrounded by beautiful homes in a new suburban community similar to theirs. They were able to examine a well-built hospital, and could question the neighbors about the possible noise, odors, and other undesirable aspects. Two days after this, the citizens met among themselves and decided that the contemplated veterinary hospital would not only be permitted, it would be desirable. The permit to erect a veterinary hospital was obtained without dissent with the rider that no outside runs be permitted and that the building be sound-proofed, with no open windows.

With the advancement in technical building knowledge, architectural design, and new materials and methods, there is no reason why a veterinary hospital, properly built and maintained, should be as much a nuisance as the corner gasoline station now accepted as a necessity in all communities. Faith in oneself and pride in the profession are evidenced by the investment necessary to erect a modern hospital. This investment is proof of integrity and the promise of good citizenship.

A veterinary hospital should be a desirable feature of every community large enough to support one.

*Jensen Green Road Animal Hospital, now operated by Dr. G. J. Miedema, was originally established in 1952 by Dr. H. E. Jensen, who practices in LaJolla, Calif.

Transfusion Tips

Except in exchange blood transfusion, where blood volume is maintained, it is advisable not to exceed 1 liter at a single transfusion in larger species, or 100 cc. in a dog. Because it is difficult to collect blood aseptically, an antibiotic "umbrella" is always advisable for the recipient when blood is to be transfused. Antibiotics should not be mixed with the transfused blood but injected separately. It is inadvisable to use as a blood donor an animal which has had considerable antibiotic therapy, because if antibodies to antibiotics were present they would be detrimental to the recipient.—*Vet. Rec., 73, (July 8, 1961)*: *661.*

Internal Parasitism of Monkeys with the Pentastomid, *Armillifer armillatus*

Werner P. Heuschele, D.V.M.

TWO MONKEYS with disease characterized by progressive debility and death were found upon necropsy to be internally parasitized with the pentastomid, *Armillifer armillatus.*

Case Reports

Monkey 1.—A pair of young adult Hamlyn's guenon monkeys *(Ceropithecus hamlyni)* were received at the San Diego Zoological Gardens on Jan. 15, 1960, from Leopoldville Zoo, Belgian Congo. Shortly after their arrival the health of the male began to deteriorate, and he died Jan. 28, 1960. On fecal examination, intestinal parasites were not found. Microfilariae or any evidence of other disorders were not found on examination of blood smears. Clinical examination produced no clues.

At necropsy, a large number of worm-like, arthropod larvae, 2 mm. thick and 30 mm. long, were in a coiled position imbedded in the omentum, mesentery, liver, and spleen; there were several larvae free in the pleural cavity (Fig. 1). The encysted coils were about 1 cm. in diameter. Gross evidence of peritonitis or pleuritis was not present. There was no perforation of any viscus. Grossly, there were no inflammatory or other tissue reactions surrounding these parasites.

Monkey 2.—A young adult male talapoin monkey *(Miopithecus talapoin)* was received from the Leopoldville Zoo, Belgian Congo, on June 3, 1960. The monkey appeared in good condition and was eating well; there was no evidence of internal parasites on fecal examination. The monkey was found dead in its cage on June 21, 1960. There had been no indication of illness prior to death.

At necropsy, the monkey was in a good state of nutrition. The omentum, mesentery, and liver contained large numbers of imbedded larvae identical to those in monkey 1. The adrenal glands were enlarged and congested.

Discussion

The parasites from each of the monkeys were identified as nymphs of *A. armillatus.* This is an arthropod of the class *Pentastomida,* the tongue worms. This is a small

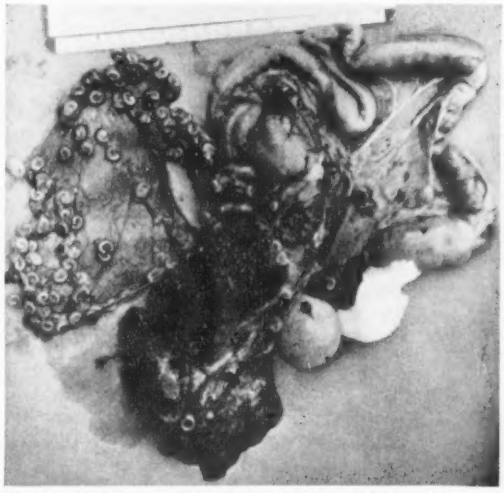

Fig. 1—Coiled nymphs of the pentastomid, *Armillifer armillatus,* in mesentery, omentum, liver, and spleen of a Hamlyn's guenon monkey (*Ceropithecus hamlyni*).

Dr. Heuschele is veterinarian at the San Diego Zoological Gardens, San Diego, Calif.

The author thanks Gordon H. Ball, Ph.D., professor of zoology, University of California at Los Angeles, and L. R. Penner, Ph.D., professor of entomology and parasitology, University of Connecticut, who identified the parasites described in this report.

group of blood-sucking arthropods which are endoparasites of vertebrates. The adults have an annulated body, and they resemble a worm. The nymphs are similar to the adults in appearance but are smaller. The adult of *A. armillatus* is an endoparasite of the lungs and alimentary tract of snakes, especially pythons, adders, and vipers. The nymph has been found in several mammalian hosts including the ape, monkey, lion, tiger, wolf, various antelope, and man. In these mammals (which are intermediate hosts), the nymphs are found usually encysted in coils in or on various organs of the thorax and abdomen. The mammalian host becomes infected presumably by drinking water contaminated with eggs of the adult passed in the feces or respiratory discharges of reptiles, or by eating the reptile host.[1-3] Little is known about the pathogenesis of this organism. The condition is probably impossible to diagnose during life, unless coincidentally discovered in the course of surgical entry to the abdomen.[3] It is presumed that as long as the parasites remain encapsulated they are harmless. Most fatalities are thought to be due to peritonitis caused by the piercing of the gut by wandering nymphs which have emerged from the capsules or cysts. Deaths in man due to this parasite have been reported.[2]

Summary

Internal parasitism with nymphs of the pentastomid arthropod, *Armillifer armillatus*, in a Hamlyn's guenon monkey (*Cercopithecus hamlyni*) and a Talapoin monkey (*Miopithecus talapoin*) was found at necropsy. In each monkey, the parasites were encysted in mesentery, omentum, liver, and spleen.

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Dental Calculus in the Dog

There are two types of dental calculus (tartar) in the dog: salivary and serumal.

Salivary calculus consists of calcium phosphate and carbonate held together by a compound calculus agglutinin which is formed after the tartar attaches to the teeth. This is soft and grayish white initially but alters into a white and clear substance. The latter becomes caseous and breaks up and disappears, but the former forms primary calculus which in time discolors due to attached particles and products of putrefaction and gingivitis.

Serumal calculus arises from and attaches below the gingival margin. Serum oozes out and forms calcoglobulin which changes and leaves a serumal calculus which is harder than salivary calculus. Color is brownish black or black.

Both types of calculus commonly occur together.—*J. South African V.M.A., 31, (Dec., 1960)*: *478.*

Editorial

"Encyclopedia" of Veterinary Activities

Reading an encyclopedia on veterinary activities can hardly be expected to increase practice income or solve the daily problems most veterinarians face. But it can broaden one's knowledge, thereby providing intangible benefits such as an increased feeling of pride and a certain amount of self satisfaction with being part of a profession that has progressed on its own solid merit.

Such an "encyclopedia" of veterinary activities and accomplishments, entitled *Veterinary Medical Science and Human Health*, recently has been published.* It was prepared by the U.S. Senate Subcommittee on Reorganization and International Organizations under the direction of Chairman Hubert H. Humphrey** (D., Minn.). Some of the principal contributors were C. D. Van Houweling, D.V.M., assistant administrator of ARS; Martin Kaplan, V.M.D., chief, Veterinary Public Health Section, WHO; Brig. Gen. J. A. McCallam, V.M.D., AVMA Washington Representative; James H. Steele, D.V.M., chief, veterinary public health, Communicable Disease Center, U.S. Public Health Service; J. G. Hardenbergh, V.M.D., formerly executive secretary of the AVMA; and E. E. Wedman, D.V.M., Animal Disease Eradication Division, ARS, USDA.

This 250-page book, divided into six parts, can serve as a ready reference for those composing speeches to be given to lay groups, to veterinary students, or to veterinarians. Prospective veterinary students will find described briefly but adequately the multitude of opportunities in veterinary medicine and the broad scope of the profession. For veterinary students it should be required reading.

It is up to date, not only in respect to the status of specific diseases, but in regard to the achievements of veterinary medicine in such fields as space science, air pollution research, and radiologic health. There is fairly detailed information on virtually every phase of veterinary medicine. Included are many facts and figures never before gathered together and probably not available elsewhere. It is comprehensive.

Below is a sampling of facts contained in this volume:

There are 25 million dogs, 25 million cats, 15 million pet birds, and 3 million horses in the United States.

The U.S. Government spends $13,000,000 on veterinary medical research annually, $65,000,000 on veterinary medical science generally, and is the largest employer of veterinarians (4,000).

The laboratory animal industry is valued at $250 million; cash value of the nation's livestock is $50 billion.

There is one veterinarian for every 200,000 domestic animals and birds.

In the United States, diseases once present that have been eradicated or drastically reduced include pleuropneumonia, cattle tick fever, foot-and-mouth disease, screwworm infection, vesicular exanthema, tuberculosis, and brucellosis.

An estimated 37 million small animals, including poultry and other birds, are used in the United States each year for research, laboratory instruction, and testing.

Average purchase price for high-grade laboratory animals is:

Animal	Cost	Animal	Cost
Mice	$ 0.33	Monkeys	$ 45.09
Rats	0.91	Hamsters	0.67
Guinea pigs	3.70	Dogs	16.25
Rabbits	6.46	Cats	5.50
Horses	300.00	Goats	50.00
Sheep	40.00	Cows	300.00

Air pollution has caused deaths of animals in England, Mexico, and the United States.

A standard licensing examination for veterinarians has been accepted by 25 states.

There were 375 foreign students edu-

*Available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., for 65 cents, or free from your congressman.

**It was resolved (Resolution 24) at the 98th Annual Meeting of the AVMA in Detroit that the AVMA commend Senator Humphrey and all members of the Subcommittee on Reorganization and International Organizations for their excellent presentation of the need for long-range, well-funded, and coordinated federal-state research efforts cross-seeding the biomedical research findings in both human and veterinary medicine, and . . . that a copy of the resolution be forwarded to the chairman and members of both the Committee on Government Operations of the United States Senate and its Subcommittee on Reorganization and International Organizations.

cated in United States veterinary schools from 1955 to 1959.

There are 1,364 faculty and staff members in United States veterinary colleges.

The 1,010 students who entered veterinary colleges in 1958 were selected from 1,924 applicants. One fourth had acquired college degrees prior to entering veterinary school.

In 1959 and 1960, 7% of all veterinary students were engaged in graduate studies.

The largest single source of funds for veterinary research is state appropriations. Most colleges spend $50,000 to $200,000 annually on research.

About 20% of the red meat animals and 10% of the processed poultry are slaughtered under state or municipal inspection or receive no inspection at all.

Federal meat inspection is carried out in 1,334 establishments located in 546 cities and towns.

There are 737 veterinarians and 2,547 others performing federal meat inspection.

There are 4,000 animal hospitals in the United States and Canada, 3,000 of which are devoted to small animals.

There are approximately 180 animal diagnostic laboratories in the United States.

Annual losses due to brucellosis dropped from $90,000,000 in 1947 to $27,000,000 in 1957.

Tuberculosis affected 1 out of 20 cattle in 1917; affected only 1 in 500 in 1960.

Veterinarians inspected 1,149,815 animals and 12,582 birds presented for importation in 1959. Of these, 21,888 animals and 1,963 birds were refused entry.

About 13% of the nation's dogs and cats are vaccinated annually for rabies.

The rabies problem in the United States is measured not so much by the number of human deaths as by the number of persons who require treatment—more than 30,000 persons each year are bitten by suspected rabid animals and are required to take treatments.

Total number of rabies cases declined 50% between 1946 and 1958. Human deaths due to rabies decreased by 73% during the same period. Dog cases declined 90%.

A system of accreditation of all schools and colleges of veterinary medicine has been used by the AVMA for more than 50 years.

There are three specialty groups officially recognized by the American Veterinary Medical Association: (1) American Board of Veterinary Public Health; (2) American College of Laboratory Animal Medicine; (3) American College of Veterinary Pathologists.

Approximately 100 veterinarians belong to the American Association of Zoo Veterinarians.

In 1959, 125 types of veterinary biologics were produced at 65 establishments.

Inspection of veterinary biological products is conducted by 33 veterinarians and 22 virus-serum inspectors.

During 1959, 91 new drug applications for veterinary drugs and 444 supplemental applications were submitted to FDA. Since 1949, more than 1,500 original applications have been reviewed by the Veterinary Medical Branch of FDA.

The FDA has 360 field inspectors who periodically inspect 84,000 establishments.

From 1952 to 1959 the ICA (International Cooperation Administration of the United States) and its predecessor agencies assisted local authorities in 19 countries with animal disease programs and the training of veterinarians. From 1952 to 1959, ICA brought 149 veterinary students from foreign countries to the United States for training. From 1956 through 1959, 98 foreign veterinarians from 32 countries came to the United States for training under sponsorship of the Foreign Research and Technical Programs Division of ARS.

Under authority of Public Law 480, $38,698 was granted to the Polish Veterinary Institute at Pulawy for liver fluke research.

Estimated number of veterinarians needed in North America in 1980 is 47,250.

At the present time, approximately 20,000 journal articles and monographs are published each year in the veterinary field, from approximately 40 countries and in 40 different languages.

In the United States, the most comprehensive current reporting of veterinary medical articles is found in the USDA Library *Bibliography of Agriculture*, a monthly index listing more than 10,000 veterinary articles each year. The British list 12,000 articles per year in *Index Veterinarius*, and abstract 4,000 articles in *Veterinary Bulletin*. More than 16,000 abstracts are published in the German *Veterinärmedizin*. There are 17 other English language abstracting publications and seven in other languages.

from the *Research Journal*

Propagation of Equine Arteritis Virus in Monolayer Cultures of Equine Kidney

The virus of equine arteritis was recovered from equine tissues collected from fetuses aborted due to experimental and natural occurrences of the disease. The virus produces a cytopathic effect which proceeded to complete necrosis of cultures of equine kidney.

Horses were infected by intramuscular or intranasal injections of various kidney cell passages of Bucyrus and Penn strains of virus. Severity of disease was reduced in succeeding passages of virus in tissue culture. All horses exposed to virus propagated in tissue culture developed immunity which, three weeks later, resisted challenge to parent Bucyrus strains of virus. The Bucyrus strain of virus was viable after six years' storage at −20 C. in a whole fetal spleen. The 44th kidney-cell passage of this strain was viable at 75 days when stored at 4 C., but was very short-lived at 37 and 56 C.—[*W. H. McCollum, E. R. Doll, J. C. Wilson, and C. B. Johnson: Propagation of Equine Arteritis Virus in Monolayer Cultures of Equine Kidney. Am. J. Vet. Res., 22, (July, 1961)*: 731-735.]

Intravenous Ether Anesthesia in Equine Animals

Fifty-two horses and mules, including 7 which were clinically ill, were anesthetized with intravenous ether, usually following administration of other drugs. Before and after anesthesia, thorough physical examinations were done and, in many cases, coagulation time, bleeding time, and plasma hemoglobin were determined. Vital signs were recorded at ten-minute intervals during anesthesia. Necropsy and limited histopathologic studies were done on all animals, except those surviving.

Twenty-four of the 45 experimental animals were assigned, at random, to four groups of 6 animals each and were given chloral hydrate and ether; promazine and ether; chloral hydrate, thiopental, and ether; or promazine, thiopental, and ether. Seven liters of 5% ether in 0.9% sodium chloride solution was injected at a rate which kept the animals in a light plane of surgical anesthesia. Blood pressure and electrocardiographic recordings were made continuously during the induction and maintenance of anesthesia of these animals.

Promazine and chloral hydrate were equally effective and satisfactory as preanesthetic agents. When anesthesia was induced with intravenous ether, a long period of moderate struggling occurred, but this did not occur when thiopental was used for induction following injection of one of the premedicaments mentioned. Good anesthesia was maintained with intravenous ether. The depth of anesthesia could be controlled easily by a person familiar with the signs of anesthesia. The most important advantage of the method is that recovery is completely free of struggling; however, the recovery period is rather long. Following an average of 74 minutes of surgical anesthesia, the animals stood after an average of 109 additional minutes. Little evidence was found of serious functional or morphologic change due to the intravenous ether.

One animal died as a result of being taken to stage IV anesthesia inadvertently by too rapid injection of ether-saline solution. One animal died while in a light plane of anesthesia. Orthopedic surgery was being done at the time of death. There is some evidence that fat emboli may have caused the death of this animal. One animal died due to laryngospasm, probably caused by injury to the larynx prior to anesthesia. Two animals developed azoturia probably due to struggling in the casting harness while the carotid artery was being isolated (for the recording of blood pressure) prior to induction of anesthesia.

The margin of safety with intravenous ether appears to be rather narrow. This anesthetic method seems less safe than others which are available. Another disadvantage

of the method is that considerable time is needed to prepare the large quantity of ether-sodium chloride required.

A useful application of the method may be to extend, for a short period, anesthesia induced by other drugs when recovery must be free of struggling.—[*A. A. Gabel: Intravenous Ether Anesthesia in Equine Animals. Am. J. Vet. Res., 22, (July, 1961): 720-730.*]

Production of Foot-and-Mouth Disease Virus with High Complement-Fixing Antigenicity

A method was devised for rapid production of foot-and-mouth disease virus with high complement-fixing antigenicity in bovine kidney, swine kidney, and lamb testis cells grown on glass. Antigen titers of 1:275 were obtained from the cell portion of cultures six hours after addition of virus to the cells. A titer of 1:160 was obtained from the fluid portion eight hours after addition of virus to the cells.—[*R. E. Patty and N. L. Norcross: Production of Foot-and-Mouth Disease Virus with High Complement-Fixing Antigenicity. Am. J. Vet. Res., 22, (July, 1961): 775-778.*]

Cultivation of Hog Cholera Virus

Studies were made of the general problem of detection of the presence of hog cholera virus (HCV) through the use of tissue culture techniques. Two subculturable swine buffy coat cell lines were developed, and HCV was propagated in one of these cell lines as demonstrated by the reaction of susceptible swine to inoculation with harvested materials.

In two studies HCV was demonstrated in concentrations of 10^2 and approximately 10^5 infective doses per milliliter on the fourth day after inoculation of the cultures. Swine buffy coat cultures became persistently infected with HCV, as demonstrated by its presence in a concentration of 10^5 infective doses per milliliter 204 days after inoculation of the culture. There was some evidence of attenuation of this virus. No cytopathic effect of HCV was observed in subculturable swine buffy coat cells.—[*R. W. Loan and D. P. Gustafson: Cultivation of Hog Cholera Virus in Subculturable Swine Buffy Coat Cells. Am. J. Vet. Res., 22, (July, 1961): 741-745*]

Homologous Transplantation of Canine Neoplasms

The objective was to develop one or more transplantable canine neoplasms for use in research on cancer surgery and therapy. Sixty-seven tumor implants prepared from 17 spontaneous canine tumors were injected subcutaneously into 48 dogs, ranging in age from 12 hours to one year. Two factors facilitating the growth of the transplants were considered in this study: treating the recipients with corticosteroids and treating them with total body irradiation. Cortisone was used in a dose of 25 mg. daily to 500-Gm. pups; prednisolone, in doses of 5 and 10 mg. daily or 20 mg. every other day to weanling pups. Thirty-one dogs were irradiated with 170 to 600 r.

In 5 dogs, there was successful growth of the transplant. They were all irradiated, 1 dog with 465, 1 with 500, and 3 with 600 r. The successfully transplanted tumors were an osteosarcoma, a mixed mammary tumor, and an ovarian adenocarcinoma. The histologic characteristics of the transplanted tumor in the subcutis of the recipients were indistinguishable from those of the donor's tumor.

It can be concluded that the depression of the reticuloendothelial system by adrenocortical hormone and total body irradiation were necessary for the successful growth of the canine transplants thus far attempted. Adrenocorticosteroid treatment alone and total body irradiation in doses less than 465 r were insufficient to permit growth of the transplants, but in combination some degree of success was achieved. The most efficient method appeared to be high-dosage radiation at the 465- to 600-r range.—[*S. E. Nielsen and C. R. Cole: Homologous Transplantation of Canine Neoplasms. Am. J. Vet. Res., 22, (July, 1961): 663-672.*]

Pulmonary Arterial Lesions in Canine Dirofilariasis

In histologic study of the lungs of 50 dogs infested with *Dirofilaria immitis* (heartworms), marked alterations of the pulmonary arterial tree were found.

Results indicated that whereas embolic, dead, adult dirofilariae occasionally lead to thrombosis and granulomatous response, the live adults frequently cause pulmonary endarteritis and obstructive fibrosis. The latter may take the form of specific lesions, described as rugose and villous endarterial fibrosis, which are believed to be of diagnostic significance.

The high incidence of obstructive pulmonary arterial lesions observed supports the view that they are important in the development of heart failure in this disease.—[*J. L. Adcock: Pulmonary Arterial Lesions in Canine Dirofilariasis. Am. J. Vet. Res., 22, (July, 1961): 655-662.*]

Formation of the Preputial Cavity in Domestic Animals

The penis is not free in the preputial cavity at the time of birth in most domestic animals. During embryonic development, an orderly hyperplastic invagination of the ectoderm around the urethra indicates the early fused state of the prepuce and the penis, the "balanopreputial fold."

The pattern of the fold differs in most animals. It is smoothly circular in the boar, ventrally interrupted in the dog, and sends off "secondary" folds in the region of the processus urethrae in the young male sheep and goat.

The splitting of the solid epithelial fold is accomplished by the formation of vesicles at different sites and their subsequent coalescing. The visceral epithelium lining the prepuce is formed exclusively from the inner split half of the "primary" fold. The outer split half of the primary fold and the entire secondary folds form the parietal epithelial lining.

The addition of the secondary folds in the young male sheep and goat leads to the formation of an extensive, folded parietal surface of the prepuce, as compared to the smooth surface of the thin processus urethrae. This folding facilitates the passage of the glans through this region during protrusion of the penis.

In the horse, the fossa glandis forms earlier than the preputial cavity.

In the dog, the ventral mesodermal interruption of the fold leads to the formation of the "frenulum."—[*M. B. Bharadwaj and M. L. Calhoun: Mode of Formation of the Preputial Cavity in Domestic Animals. Am. J. Vet. Res., 22, (July, 1961): 764-769.*]

Some Histochemical Studies of "Cloisonné Kidney" in the Male Angora Goat

The chemical composition of the pigmented homogeneous material associated with the basement membranes of the proximal convoluted tubules of the kidneys of castrated male Angora goats in "Cloisonné kidney" condition was studied histochemically. By microincineration, the pigment was shown to contain considerable inorganic material, not identifiable as iron or soluble calcium salts. The pigment gave a positive periodic acid-Schiff (PAS) reaction attributable to vincinal glycolic groups. Also found in the pigmented material were demonstrable quantities of cysteine, cystine, tyrosine and amino groups. The material did not contain demonstrable iron, soluble calcium salts, acid mucopolysaccharides, glycogen, ethylenic linkages, preformed aldehydes, or nucleic acids. The precise cause of the condition is not known.—[*S. W. Thompson, T. R. Bogdon, and D. H. Yost: Some Histochemical Studies on "Cloisonné Kidney" in the Male Angora Goat. Am. J. Vet. Res., 22, (July, 1961): 757-763.*]

Pulmonary Adenomatosis of Sheep—Metastasizing Bronchiolar Tumors

A pathologic study of pulmonary adenomatosis of sheep in Peru is reported emphasizing its neoplastic nature. Gross and microscopic examinations were performed on 60 sheep with routine histologic techniques; 22 of them had incipient lesions, and 38 had advanced lesions.

In the study of incipient lesions, an attempt was made to establish the histogenesis of this process by finding out its bronchiolar origin. Metastasis was found in the regional lymph nodes of 3 sheep. Also described in the report are clinical signs of pulmonary adenomatosis of sheep and some considerations in study of its epidemiology such as climate, geographical distribution, and altitude above sea level.—[*A. Cuba-Caparo, E. de la Vega, and M. Copaira: Pulmonary Adenomatosis of Sheep—Metastasizing Bronchiolar Tumors. Am. J. Vet. Res., 22, (July, 1961): 673-682.*]

New Books

Proceedings of Veterinary Food Hygienists

The proceedings of the second symposium of the International Association of Veterinary Food-Hygienists, which was held in Basle, May 15-21, 1960, are available and can be ordered by the secretaries of the "International Association of Veterinary Food-Hygienists," Sterrenbos 1, Utrecht, The Netherlands. The book of nearly 400 pages contains numerous lectures of veterinary food-hygienists from 20 different countries and the discussions held during the symposium. The copies can be ordered after prepayment of $7.00 to the bank Vlaer & Kol, Utrecht, The Netherlands, on behalf of the secretary-treasurer of the I.A.V.F.H.

A limited number of proceedings of the first symposium of the International Association of Veterinary Food-Hygienists, at the cost of $4.00, are still available at the secretariate.

Atlas of Avian Hematology

This is a complete and up-to-date work on avian hematology. The subject matter deals not only with the circulating blood of the adult bird, but also with that of the embryo during its incubation from two days to hatching, and includes developmental stages found in blood-forming organs of both the adult and embryo. The numerous color illustrations and line drawings are especially useful and extremely well done. The identification of early and intermediate stages of development for many cell types has been worked out for the first time. Blood cells of many fowl other than chickens are also described and illustrated. There is a separate chapter on hematologic techniques as applied to avian blood. The main effort has gone into recording what was seen and putting the cells in serial order whenever possible.

The publication should serve the needs of poultry scientists, veterinarians, and research workers generally.—[*Atlas of Avian Hematology. By Alfred M. Lucas and Casimir Jamroz. 271 pages; illustrated. Agriculture Monograph 25. U.S. Department of Agriculture, Washington, D.C. 1961. Price not given.*]

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WHAT IS YOUR Diagnosis?

Make your diagnosis from the pictures below—then turn the page ▸

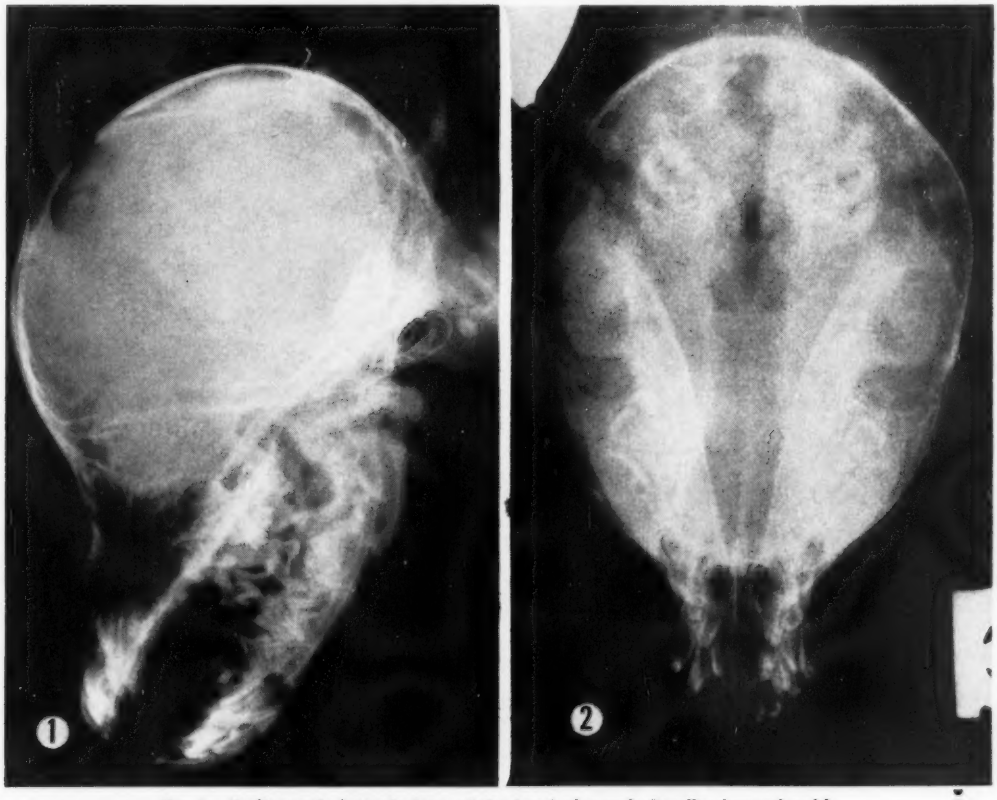

Fig. 1—Radiograph, lateral view, of the head of a male Poodle, 2 months old.

Fig. 2—Radiograph of the head, dorsoventral view.

History.—A male Poodle, 2 months old, walked with an arched back and cried out when it was picked up. Occasionally it cried out when no one was near. The malbehavior was progressive until the dog appeared depressed, apprehensive, and bumped into objects. During this time, the size and shape of the head expanded out of proportion to the body and the fontanel was open at the junction of the parietal and frontal bones. When 10 cc. of spinal fluid was removed from the cisterna magna, improvement resulted for a few days. Dorsoventral and lateral radiographs were taken of the head (Fig. 1 and 2).

Here Is the Diagnosis

(*Continued from preceding page*)

Diagnosis.—Hydrocephalus. Notice the ground-glass appearance of the cranial cavity, the open fontanel (Fig. 3), and the expanded shape of the skull (Fig. 4).

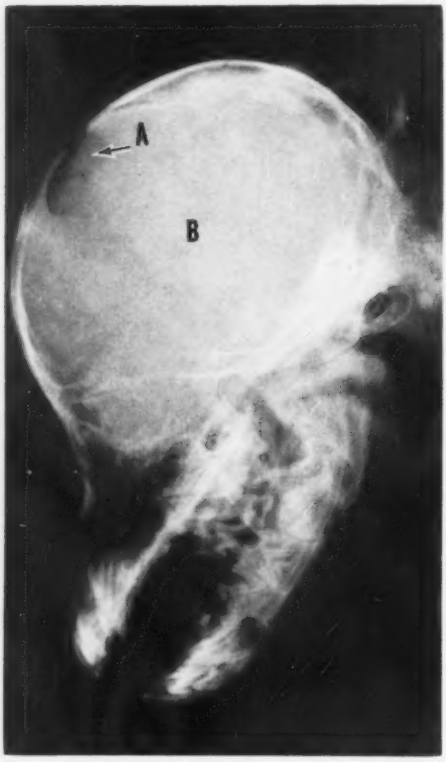

Fig. 3—Radiograph, lateral view, of the head of the Poodle showing open fontanel (A) and ground glass appearance of the skull (B).

Comment.—Hydrocephalus results from an abnormal accumulation of fluid within the system of cerebral ventricles due to interference with the flow and absorption of cerebrospinal fluid. Under normal conditions, fluid from the lateral ventricles communicates with the third ventricle by means of the foramen of Monro, and then with the fourth ventricle through the two lateral foramina (Luschka), and into the subarachnoid spaces. The excess accumulation of cerebrospinal fluid in the ventricles of the brain at first causes a lasting increase in intracranial pressure. The pressure gradually becomes greater and causes uniform atrophy and diminution of function of the brain. The dilation of the lateral ventricles is manifested by excessively rapid increase in the size of the head and separation of the cranial sutures.[1]

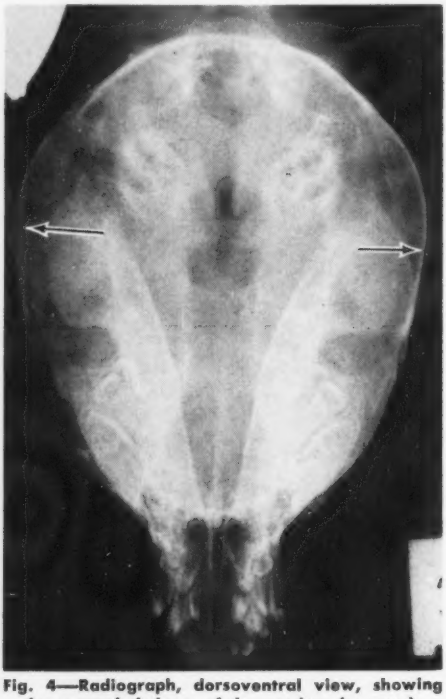

Fig. 4—Radiograph, dorsoventral view, showing the expanded shape of the cranium (arrows).

[1]What Is Your Diagnosis? J.A.V.M.A., 135, (Dec. 1, 1959): 25-27.

This case report was presented by Dr. W. H. Rhodes, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, and was prepared with the assistance of Dr. W. H. Riser, Kensington, Md.

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After a three-year study[1] of four dairy herds containing 530 "problem breeders," investigators found that FURACIN Suppositories Veterinary gave these results:

	Services per conception	*Days between calvings*
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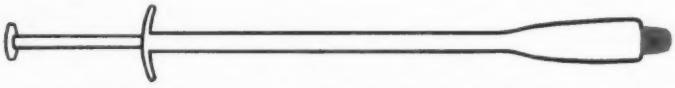

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References: 1. Vigue, R. F., et al.: J. Am. Vet. M. Ass. 134:308 (Apr. 1) 1959.

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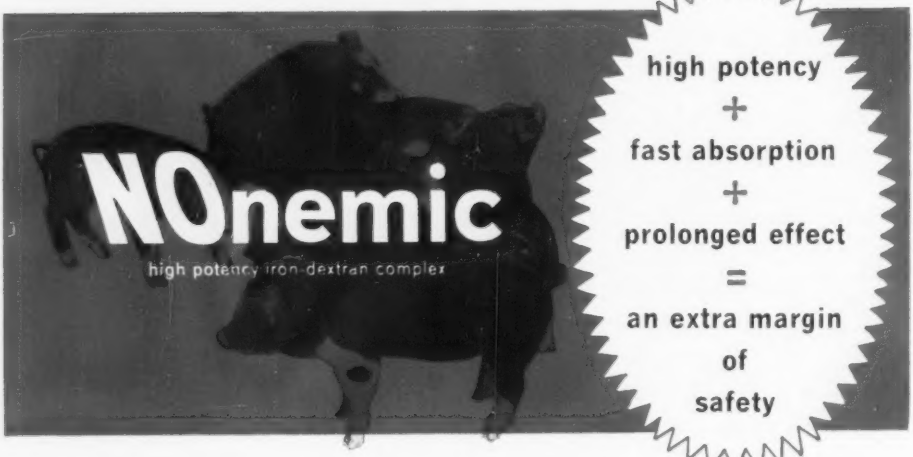

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CLINICO-PATHOLOGIC CONFERENCE

From the School of Veterinary Medicine
University of Pennsylvania

Prepared by:

R. S. Brodey, D.V.M., M.Sc. (V.S.)

Assistant Professor of Veterinary Surgery

J. E. Prier, D.V.M., Ph.D.

Associate Professor of Virology

Presentation of Case

*Dr. R. Marshak.**—An aged Aberdeen Angus bull was referred to the Veterinary Hospital as "an interesting case." It was not possible to obtain a past medical history or even an adequate history of the present illness. We could only learn that the animal had been "ailing for a number of weeks."

At the time of admission, the bull appeared to be thin but not cachectic, with a quiet disposition, an apparent disinclination to move about, and a dull, rough coat. There was marked ventral edema extending from the brisket to the scrotum, involving the fore- and hindlimbs. Edema of the sheath had resulted in prolapse of the preputial mucosa. However, ability to urinate was unimpaired and there appeared to be polyuria. The abdomen was large and somewhat pear-shaped. There was profuse, green, watery diarrhea. The body temperature was 101 F., pulse rate 64, and the mucous membranes were pale and slightly cyanotic. Forced exertion resulted in severe respiratory distress. The rumen was con-

*Dr. Marshak is professor of medicine.

LABORATORY DATA

URINALYSIS

	1st day	2 days later
Appearance	pale, pink-yellow clear	light pink-yellow, clear
Specific gravity	1.006	1.009
pH	7.0	7.5
Sugar	—	—
Protein	....	....
Ketones	—	—
Bile	....	....
WBC	....	....
RBC	....	occasional
Casts	....	few, fine granular
Crystals—mod. amorphous phosphates	—	—
Bacteria	moderate amount	few
Epithelia	moderate amount —renal	many—renal

HEMATOLOGIC FINDINGS

WBC	11,750	Calcium	6.7 mg./100 ml.
segmented	56%	Total protein	3.3 Gm./100 lm
nonsegmented	1%	RBC	4,980,000
Lymphocytes	35%	PCV	29%
Monocytes	6%	Hb	9.6 Gm./100 ml.
Eosinophils	2%	Na	138 mEq./liter
Blood urea nitrogen (BUN)	102.8 mg./100 ml.	K	5.4 mEq./liter
Sugar	70 mg./100 ml.	Cl	98.6 mEq./liter
Inorganic phosphorous	8.8 mg./100 ml.	CO_2	30.5 mM/liter
		A/G	0.36

ASCITIC FLUID EXAMINATION

	1st day	2 days later
Specific gravity	1.009	1.009
Urea nitrogen	102.8 mg./100 ml.	104.7 mg./100 ml.
Total protein	....	136 mg./100 ml.

tracting twice per minute and the bull ate sparingly. On auscultation, the heart sounds were muffled and lung sounds were inaudible in the ventral thorax, which was dull on percussion. Abdominal paracentesis produced a clear, colorless, odorless fluid which clotted feebly.

There was slightly low amplitude in all electrocardiographic leads. The QT interval was 0.24 sec.; PR interval 0.24 sec.; and the QRS interval 0.21 sec. The electrical axis was within normal limits.

Rectal palpation was difficult to perform because of severe diarrhea and ballooning of the rectum. Rectal findings were negative.

Seven days after admission, the bull died and a necropsy was performed.

Case Discussion

*Dr. J. Buchanan.**—Based on the history and the general appearance of this animal, there seems to be chronic involvement. The most striking clinical findings are edema, ascites, and pleural effusion. Such generalized loss of fluid from the blood stream is usually caused by hypoproteinemia or cardiac failure. The most common causes of hypoproteinemia are nephritis, hepatitis, nutritional deficiency, and parasitism. These, however, need not be unrelated and often more than one is present in a given case.

There is nothing in the history or clinical findings which can be explained solely on the basis of cardiac failure. With the exception of low amplitude, the electrocardiographic findings are normal. This, together with dyspnea and cyanosis, is often found in animals with pleural or pericardial effusion or both. Pleural effusion can be caused by cardiac failure, hypoproteinemia, or pleuritis.

In the hemogram, the ratio of segmented neutrophils to lymphocytes is nearly opposite to normal. This, together with an absence of immature red blood cells and a low packed cell volume and hemoglobin concentration, leads me to consider some general intoxication of the bone marrow. However, it is also suggestive of an aleukemic leukemia. The presence of uremia is suggested by a high blood urea nitrogen (BUN), three to four times the normal value, elevation of serum inorganic phosphorus, and depresion of serum calcium. Uremia also might account for the diarrhea and for the changes in the hemogram. The albumin-globulin ratio in cattle normally is about 0.9; in this case the A/G ratio of 0.36 coupled with a total blood protein of 3.3 Gm./100 ml. indicates that there has been quite a loss of albumin. It has been stated that when blood protein drops below 5 Gm./100 ml., edema can develop in the absence of capillary damage. However, the degree of uremia present in this case indicates that some capillary damage probably has occurred. The serum sodium and chloride values are on the low side of normal. This could be secondary to the diarrhea or nephritis.

Looking at the urinalysis, we find a consistently low specific gravity. The appearance of the urine is clear though somewhat pale or pink-yellow in color. These findings would be consistent with interstitial nephritis. A 4-plus protein is strongly suggestive of nephritis and this is observed most commonly in glomerulonephritis. Bile in the urine suggests the possibility of liver damage; however, 1-plus is not very significant. The absence of casts in the first urine sample might be misleading. In interstitial nephritis, granular casts are frequently present unless the urine is alkaline as in this case. Moderate amorphous phosphate crystals are normally present in alkaline urine. The presence of moderate to many renal epithelial cells suggests tubular damage.

The specific gravity of the ascitic fluid is about the same as that of the urine. There is a high level of urea nitrogen present and there was a small amount of protein in the sample taken two days after admittance. The low protein and specific gravity of the ascitic fluid suggests that it is a noninflammatory transudate rather than an inflammatory exudate.

I would now like to discuss my original statements concerning the causes of edema. The possibility of poor nutrition cannot be evaluated because of the inadequate history. The degree of parasitism also cannot be evaluated, since a fecal examination was not reported in the laboratory data. I think that fecal examination should be done in any case of anemia or edema

*Dr. Buchanan is instructor in cardiology.

or both. However, the age of this animal makes it unlikely that poor nutrition or parasitism is responsible for the edema. I would consider that edema related to cardiac problems is a secondary factor in this case since the laboratory findings related to uremia would account for the clinical condition of this animal. My inclination at this time is to consider nephritis as the primary problem.

Pyelonephritis caused by *Corynebacterium renale* is a common disease in cattle; however, it is not common in bulls. In this disease, the urine is stringy, viscid, and dirty gray or often bloody, whereas in this animal the urine was clear. This makes me less suspicious of pyelonephritis. Traumatic pericarditis is a possibility. However, such animals often have signs of traumatic gastritis. I don't believe there are indications that this was the case in this animal, as the rumen was active, with a rate of about two contractions per minute. Brisket disease might be considered. Again, the history does not indicate that this animal was being subjected to altitude changes, and I think that the evidence of nephritis would make one less suspicious of brisket disease. Other things to consider as causes of nephritis might be poisoning, secondary involvement to some pyogenic infection elsewhere in the body, or therapy with drugs such as sulfonamides or certain anthelmintics.

The primary diagnosis in this case is chronic interstitial nephritis with some degree of glomerular involvement to account for the loss of protein in the urine.

Dr. R. S. Brodey.—Why did you use the term "interstitial nephritis"? My understanding is that it is primarily seen in dogs and is rather unusual in cattle where pyelonephritis is the common finding.

Dr. Buchanan.—I use the term "interstitial nephritis" because the urine has low specific gravity and is clear. Pyelonephritis, on the other hand, is rare in the bull and can be diagnosed quite easily by urinalysis. The urine is gray, appears "dirty," and there are blood clots, epithelial matter, and bacterial cells which have a tendency to clump and form a distinct layer when the sample is centrifuged. Also, pyelonephritis seldom reaches the stage of uremia. In glomerulonephritis, the specific gravity is generally elevated and there is oliguria rather than polyuria. I hesitate to pinpoint a pathologic diagnosis. I prefer to say that the case is one of nephritis.

*Dr. D. Cohen.**—Why did you not mention leptospirosis in your discussion?

Dr. Buchanan.—Uremia in cattle is not a clinical characteristic of leptospirosis in this country where the most common serotype is *Leptospira pomona*. It is reported to occur frequently in Israel in cattle infected with *Leptospira grippotyphosa*.

*Dr. W. D. Malherbe.***—I've had the opportunity of discussing this case with Dr. Buchanan and I think that we are in agreement on it, particularly the very definite involvement of the kidneys. While I was sitting here, though, I was thinking that if I were back home in South Africa I would be almost certain to make a diagnosis of liver fluke infection. I don't know if you see it here, but this is a classical picture of *Fasciola hepatica* infection. The edema, the low albumin, and the diarrhea are characteristic. Dr. Buchanan did mention the lack of a fecal examination here which I think would be rather important in such a case. In addition, I might say that some liver studies should have been made; the only evidence we have on the status of the liver is 1-plus bile in the urine. I'd have liked to have had more definitive tests of liver function because, generally speaking, I'm not much impressed with the kidneys as a big loser of albumin in animals. With such a low serum albumin, I definitely want more information about the liver. Please understand that I am not discounting the kidneys—they are definitely involved—but some of these other things, particularly the edema and the low serum albumin value, require explanation.

Dr. R. S. Brodey.—Would you expect an animal with a liver fluke infection to have such an elevated BUN?

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*Dr. Cohen is assistant professor of veterinary pub'ic health.

**Dr. Malherbe is visiting professor of clinical laboratory medicine.

Dr. W. D. Malherbe.—Kidney involvement, I think, is not in question at all; it is definitely present—we are dealing with an old bull. What I've really been trying to do is to explain the low albumin and the presence of the widespread edema which I don't feel are explained by the kidneys alone.

Dr. R. R. Marshak.—Even with a chronic 4-plus proteinuria?

Dr. W. D. Malherbe.—Well, in the absence of actual figures on what that albumin amounts to, one is usually surprised to find how little albumin is lost over 24 hours if you do actual determinations. However, we don't have figures here, so we'd only be guessing. In the nephrotic syndrome in man this plays a big role, but in animals it seems to be subordinate to liver as an albumin loser.

Dr. J. E. Prier.—To me, the outstanding deficiency in this case is the failure to culture for bacteria. I presume there is a reason for this, but I also presume that the necropsy does not have the same deficiency.

Clinical Diagnosis

Chronic nephritis with glomerular involvement.

Pathologic Findings

*Dr. R. M. Sauer.**—On primary incision, edema found in the subcutaneous tissues was 3 or 4 cm. in depth and moist (this was noticed clinically). The subcutaneous fat contained many flecks of white, opaque chalky material which on histologic examination proved to be necrosed fat. Fat deposits everywhere in the body had a similar appearance, especially in the pericardium and the mediastinum where large masses of a firm, white, and soaplike fatty material were found. Also, several gallons of clear, watery fluid were present in the abdominal cavity. The thoracic cavity was approximately half-filled with a clear serous fluid which clotted upon standing. Upon examination of the pancreas, there were large disseminated areas which appeared firm, white, and soapy, and these infiltrated the spaces between what appeared grossly as normal lobules. The kidneys were of normal size, grayish, and firm. The capsule stripped with ease. The surface was uniformly granular, or what some might call finely pitted. Resistance to cutting was greater than normal. The cortex was mottled with gray and the cortical striations were indistinguishable. The glomeruli appeared as minute waxy bulging hemispheres and stained with Lugol's solution. The liver was not remarkable either grossly or histologically. Histologically, there was chronic pancreatitis and, as I mentioned before, the adipose tissue everywhere contained soaps. The kidney was in an advanced state of amyloidosis. Chronic nephritis was also present.

These were the pertinent findings and the final diagnosis was chronic nephritis with amyloidosis or the reverse, whichever you might consider to be the more important. A diagnosis of fat necrosis should also be mentioned and may be pertinent as regards the cause of the amyloidosis. In my opinion, the chronic nephritis is probably secondary to the amyloidosis.

There are many interesting things in this case which I think need explanation. The first is fat necrosis. In cattle, fat necrosis involving the abdominal cavity can possibly be explained (as in dogs) on the basis of a pancreatitis which we did have in this case. In many other cases we haven't been able to point this out. It is hypothesized that pancreatic enzymes released into the lymphatics pass all the way around the abdominal cavity and may even pass into the thoracic cavity. This is a possible explanation for the soaps that we find in the pericardial sac. One thing that is difficult to explain is the presence of fat necrosis in the subcutaneous tissues. In many instances this is explained as a result of trauma or something of this nature, but to me, in this particular case, it would seem that it is part of the systemic involvement. The distribution of the amy-

*Dr. Sauer is assistant professor of veterinary pathology.

loid was extremely interesting. Histologically it involved the glomeruli; the capillary tufts of the glomeruli were almost completely obliterated. Amyloid was also found around the tubules especially in the cortex and around blood vessels. Supposedly, uremia develops from amyloidosis due to interference with the blood supply. The encroachment upon the blood vessels causes anoxia and this in turn can produce degeneration of the tubules; nephritis can be secondary to this.

Dr. R. R. Marshak.—One of the cardinal signs of amyloidosis in cattle and other species is excessive proteinuria. In cattle, where this is not a common finding, as Dr. Malherbe pointed out, I always think of amyloidosis whenever I see a chronic severe proteinuria. I would guess that the amyloidosis was secondary to the nephritis rather than the other way around—this is the usual explanation that is offered in discussions of amyloidosis in the literature. Also, I was struck by the resemblance of this whole syndrome to the nephrotic syndrome in man. Everything was there except we didn't measure the degree of lipemia—there was albuminuria, hypoalbuminemia, edema, and ascites. Another thing about fat necrosis in cattle is that the quality of dietary fat may be involved.[1] Unfortunately, I could not obtain this animal's dietary history, but cattle eating long-chain saturated fatty acids or their esters are supposed to develop fat necrosis. The other possibility, I suppose, is that pancreatic enzymes might be circulating in the blood and in this way reach fat all over the body.

Dr. W. D. Malherbe.—I would like to raise the question as to whether a lack of pancreatic enzyme could be related to the hypoproteinemia?

Dr. R. R. Marshak.—I presume it could have been a contributing factor, but I think that this bull must have had a 4-plus proteinuria for weeks and maybe months, and I think that this excesive proteinuria alone could easily account for the hypoproteinemia.

Dr. R. M. Sauer.—There is one other point that I'd like to mention. I was interested to hear you say that the amyloid is considered secondary to the nephritis. In the classification of amyloidosis, one considers primary and secondary amyloidosis. The secondary is the most common form occurring in animals and is usually said to be associated with a protracted primary disease with extensive tissue breakdown. I don't believe that primary amyloidosis has ever been seen in animals. There is also a difference in distribution so that, in the primary form, amyloid is usually found in muscles and heart; while, in the secondary form, it is in the kidney, spleen, and liver.

Dr. R. R. Marshak.—A type of systemic amyloidosis has been reported in horses frequently given injections of antigens for production of hyperimmune serum.

Dr. R. M. Sauer.—Coming back to secondary amyloidosis, this is usually considered to be related to some necrotic process which is going on in the body—in this case, it may have been related to fat necrosis. What are your thoughts about the relationship of the nephritis to the amyloidosis?

Dr. R. R. Marshak.—In man, chronic nephritis can be the inciting cause.[2] It is one of the conditions associated with tissue destruction and infection which can result in the deposition of amyloid.

Dr. J. E. Prier.—I get the very distinct impression from this discussion that you have been talking about secondary effects being caused by secondary effects, and I wonder if you would care to make a statement as to what you think a primary cause might be? And again, I would ask the question as to why, with nephritis and pancreatitis, there were no cultures taken at necropsy?

Dr. R. M. Sauer.—To summarize, it looks as though two possibilities exist. In one, chronic pancreatitis produces fat necrosis which leads to secondary amyloidosis and in turn to nephritis. In the other, chronic nephritis leads to amyloidosis, the pancreatitis and fat necrosis being unrelated.

*Dr. W. Lawrence.**—I am puzzled as to why pancreatitis is always invoked to explain fat necrosis, since I consider it unlikely that an individual's enzymes are capable of digesting his own tissue. Also, in view of the fact that enzymes are quite specific with respect to pH requirements, temperature, substrate, and so forth, I do not think that leakage of pancreatic enzymes would explain such lipolytic activity.

Dr. R. R. Marshak.—This view is based upon certain types of experimental evidence. For example, pancreatic enzymes injected into the abdominal cavity have resulted in digestion of fat leading to fat necrosis. The fat is hydrolyzed to glycerol and fatty acids. The fatty acids combine with metallic ions to form soaps. I think that it is entirely possible for an animal's lipolytic enzymes to digest its own fat when in contact with such fat. The enzymes of the pancreas—not insulin and glucagon, of course, but the digestive enzymes of the pancreas—are intended only for secretion into the gut and not anywhere else. It is also interesting that you can often correlate the finding of fat necrosis with a degree of pancreatitis.

Dr. R. M. Sauer.—I think this is sometimes harder to explain in the cow than it is in the dog the cat. In the dog and the cat, pancreatitis and fat necrosis occur rather frequently and the necrosis is usually limited to the fat right in the area of the pancreas. I think the huge masses involving all of the fat in the abdominal cavity of cattle is sometimes harder to explain on this basis.

Dr. J. E. Prier.—Getting back to my original complaint; as I understand it in this bull, the disease is blamed primarily on his chronic interstitial nephritis. Now my question, then, is this: What is suggested as the cause of chronic interstitial nephritis in cattle?

Dr. R. M. Sauer.—This is a logical and pertinent question but the etiology cannot be fully explained because of the lack of bacteriologic evidence. There are primarily two types of interstitial nephritis, one of which, in man at least, is associated with toxins following streptococcic and leptospiral infection. This is a diffuse interstitial type of nephritis. The other type is a focal form in which the bacteria themselves lodge in the kidney and spread through the interstitium. This is spoken of as "pyelonephritis" and may be ascending or hematogenic. Now, as far as animals are concerned, cultures have not often been attempted and, in many instances, there is superficial evidence to the effect that existing infection elsewhere in the body might possibly produce whatever these substances are that are necessary to damage the kidney. However, this hasn't been worked out in animals. It is something which should be studied so that the whole problem of nephritis in cattle or in dogs (where it's probably most common) can be better understood.

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Pathologic Diagnoses

1) Amyloidosis of the kidney.
2) Chronic nephritis.
3) Chronic pancreatitis.
4) Generalized fat necrosis.

References

[1]Ribelin, W. E., and Deeds, F.: Fat Necrosis in Man and Animals. J.A.V.M.A., 136, (1960): 135-139.
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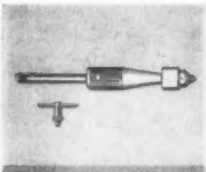

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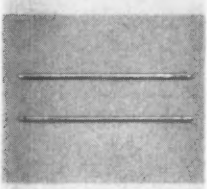

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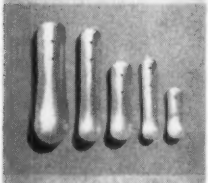

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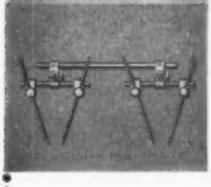

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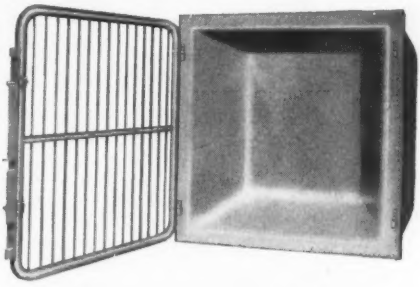

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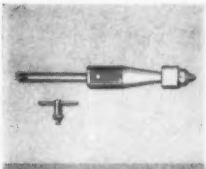
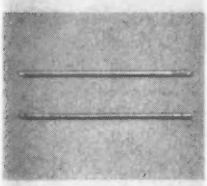


pin drill

A precision made instrument for accurate placement of intramedullary and external fixation pins.

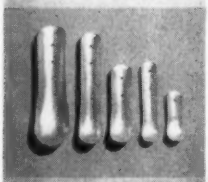


intramedullary pins

Made from the finest surgical stainless steel; three style points available in seven diameters.

pin cutter

A very rugged cutter designed especially to withstand the tremendous pressures required in the cutting of surgical stainless pins.

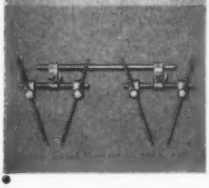


mason meta splints

A handy splint for immobilizing minor fractures and soft tissue injuries in the lower leg and paw.

thomas splints

Unique design allows for maximum flexibility in application. Available in five sizes.



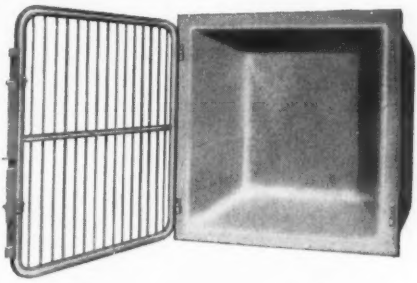
external fixation

The time proven method of reducing and immobilizing fractures under a closed reduction.

depend on Kirschner for your fracture equipment

Kirschner

HEADQUARTERS FOR THE ORIGINAL GLASS PLASTIC CAGE



The finest cage you can buy and at a remarkably low price.

Constructed from the finest quality fiberglass resin alloys, especially compounded for animal cages. Proven durability with lowest maintenance costs.

Molded, seamless construction throughout . . . glass smooth interiors . . . rounded corners for ease of cleaning . . . warm to the touch (unlike metal or masonry), your patients are comfortable and as a result, quieter.

You will be as proud of your cage wards as you are of your waiting room . . . your clients will be impressed with the sanitary and comfortable appearance of their pet's temporary home.

Send complete information regarding

☐ new catalog-technic booklet.
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DVM

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Vashon, Washington

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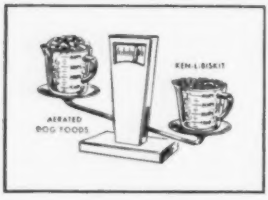
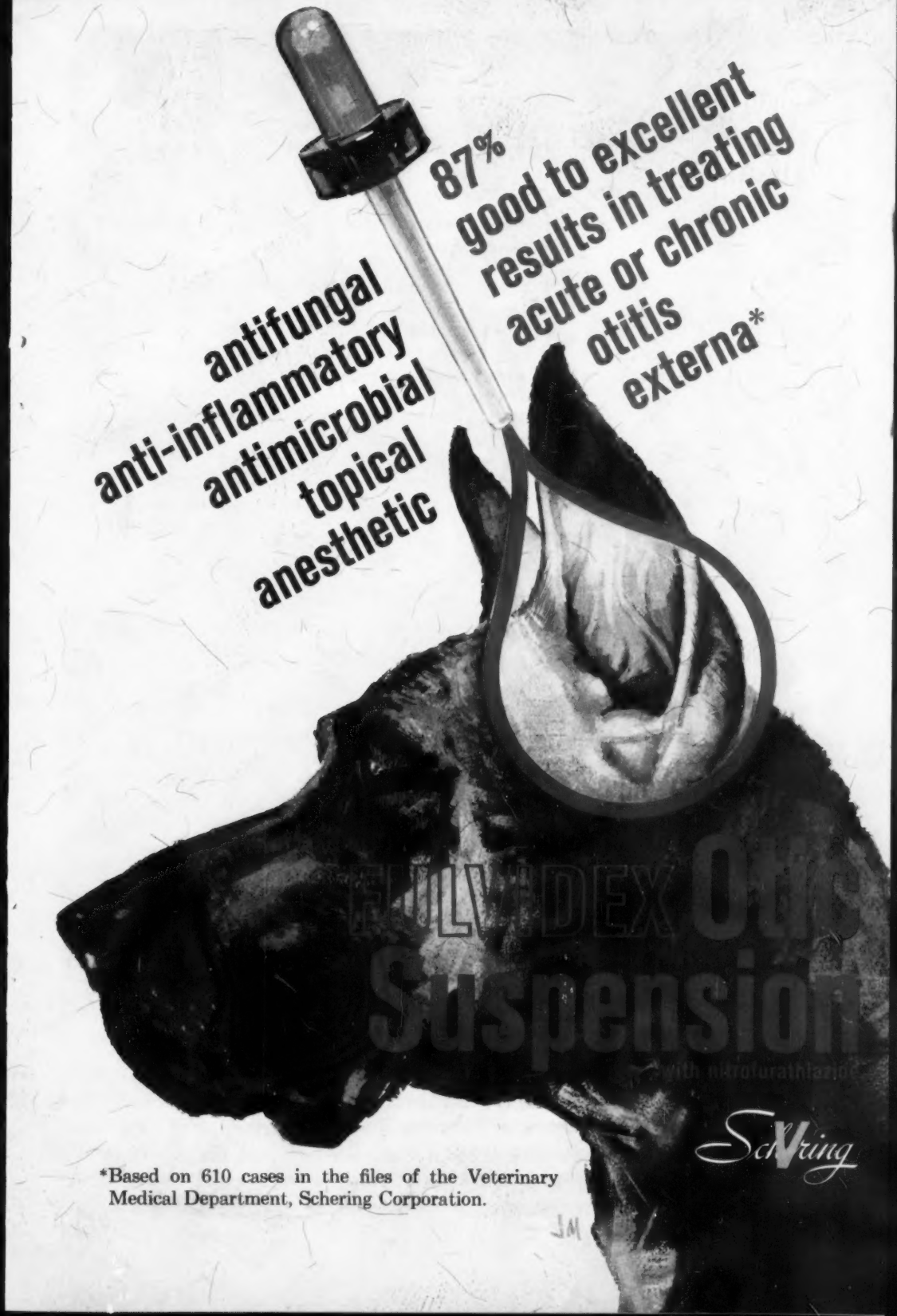
OVEN-ROASTED

Ken-L-Biskit provides more usable nourishment in every cup!



This diet does more to build peak condition . . . has meat protein from meat meal for growth and meat fat for glossy coats. Yet the cost per feeding is highly economical.

For Ken-L-Biskit has more *usable* nourishment in every cup. Oven-roasting makes it more completely digestible (more appetizing too!). And, unlike many dry foods, Ken-L-Biskit is *not* aerated. That means more protein, vitamins, minerals—more of every known essential nutrient in every cup! See how economical it really is—Ken-L-Biskit!



*Based on 610 cases in the files of the Veterinary Medical Department, Schering Corporation.

prognosis: GOOD

- ✓ **inflammation, itching, discomfort usually relieved in hours**
- ✓ **acute cases generally clear in 3-5 days**
- ✓ **troublesome chronic cases clear usually in two weeks and, in most cases, are controlled with low-dosage therapy**
- ✓ **pets promptly calm down, stop scratching and regain appetites**
- ✓ **dropper bottle assures ease of administration and convenience for follow-up home use**

. . . provides a full measure of control in acute or chronic otitis externa of dogs and cats

BACTERIOSTATIC: nitrofurathiazide, a new Schering compound, exhibits antimicrobial activity against both gram-positive and gram-negative bacteria

FUNGISTATIC: the antifungal activity of griseofulvin and undecylenic acid against pathogenic fungi of the microsporon and trichophyton species is well documented

ANTI-INFLAMMATORY: dexamethasone, the corticosteroid with greatly enhanced anti-inflammatory activity, reduces inflammation and erythema of the infected ear canal

TOPICAL ANESTHETIC: tetracaine hydrochloride acts promptly to minimize pain sensations

AN EXCELLENT DISPENSING ITEM

packaging: FULVIDEX® Otic Suspension Veterinary, 25 cc. dropper bottle, carton of 12; 1 pint bottle, box of 1.

For complete details, consult latest Schering literature available from your Schering Representative or Veterinary Medical Department, Schering Corporation, Union, New Jersey.

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The future of veterinary research demands superbly trained research workers. To supply the demand, THE AVMA FELLOWSHIP PROGRAM offers financial aid to graduate veterinarians for further training in research or teaching.

The need for these scientists is critical—and your help is needed to continue the AVMA FELLOWSHIP PROGRAM. Please contribute generously, either directly to the AVMA Research Trust or through your local Women's Auxiliary.

J. F. Smithcors, D.V.M., Ph.D.

History of the AVMA

1920

At the 1920 meeting in Columbus, President C. A. Cary, urging a reappraisal of teaching methods, said, "Some teachers stuff the student with too many . . . useless facts . . . . Too many teachers believe that the whole knowledge of medicine is confined to his special subject . . . ." He asked that less time be spent on the anatomy of the horse and more on that of other species, called for better animal husbandry and clinical facilities, and a requirement that vacations be spent in practice. The curriculum should be arranged, said Dr. Cary, for the potential general practitioner, with specialties reserved for graduate study; ". . . less time should be wasted on football, other games, holidays and numerous idle periods."

Dr. Cary advocated revision of the AVMA constitution so that members in good standing might vote on important subjects and in election of officers. "In addition to an all-time Secretary and Editor, we need an all-time home for this double head and heart of the organization . . . . Our frequent and sudden changes of Secretary and Editor have given us no stability or definitiveness of purpose . . . ." Since 1915, there had been three editors and four secretaries. The idea of a permanent location met with approval, and the Executive Board was directed to investigate locations and costs.

The membership applications of R. V. Cannon and J. G. Slade, both colored, were approved by a large majority after W. H. Hoskins stated, "For twenty years we have drawn the color line in this Association . . . . there have been rejected on that ground several good veterinarians," and P. A. Fish added, "The Government recognizes these men in their appointments in the Bureau, and if they can qualify in that respect it seems to me that they should be allowed to come in this."

R. R. Dykstra, comparing the use of anesthetics in veterinary and human surgery, charged, "In veterinary surgical operations we have not yet advanced to the same stage of humaneness in the treatment of our patients . . . . Many veterinarians do not realize the unfavorable, or . . . almost repulsive, impression made . . . by the barbaric cruelty of surgery without anesthesia . . . . Outside of the difficulties in application, . . . there is no excuse for . . . operations without adequate anesthesia."

The section on General Practice and Surgery included papers on veterinary medicine in France by L. A. Merillat, traumatic indigestion by D. H. Udall, swine diseases by C. H. Stange and C. Murray, skin diseases in dogs by H. J. Milks, cryptorchidism by E. E. Wegner, and sclerostomiasis in horses by C. E. Covault. The section on Sanitary Science included papers on brucellosis by C. M. Carpenter, I. F. Huddleson, B. T. Simms, J. P. Turner, and R. A. Kelser, anthrax by A. Eichhorn, botulism by R. Graham, and avian epithelioma by J. R. Beach.

✦ ✦ ✦

CHARLES ALLEN CARY was born at Millersburg, Iowa, in 1861 and taught school before graduating from Iowa State (B.S., 1885; D.V.M., 1887). After practicing for a time, doing state work in Iowa, teaching in South Dakota, and studying in Europe, he became Professor of Veterinary Science at the Auburn Polytechnic Institute (Auburn University) in

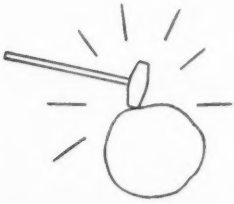
Dr. C. A. Cary

1893. In 1907, he was instrumental in the establishment of the first veterinary school in the South at Auburn and served as its dean until 1935. Through his influence as State Veterinarian and long-time president of the Alabama Live Stock Association, Alabama was the first state to require health certificates for animals in interstate shipment. An early advocate of tick eradication and municipal food hygiene, he devoted his entire professional life to bettering livestock sanitation in Alabama.

Dr. Cary joined the AVMA in 1890, was elected president in 1919, and worked actively during his 45-year membership, probably serving on more committees than any other member. He was a member of the Executive Board at the time of his death, April 23, 1935.

Solves complex problem of OTITIS THERAPY

TYMPACAINE®



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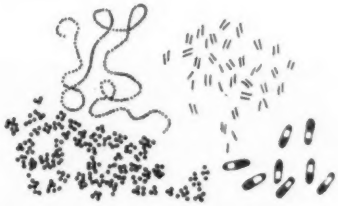
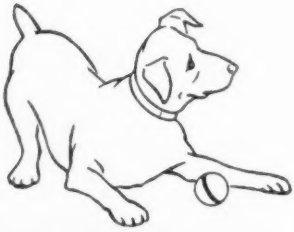


WIDE-SPECTRUM SULFONAMIDE

Highly effective against a wide range of pathogenic bacteria . . . *even problem pathogens* like Pseudomonas and Staphylococcus.



PROLONGED TOPICAL ANESTHESIA

Relief from pain is *quick, profound, prolonged* . . . benzocaine stops scratching and thus reduces the spread of infection . . . hastens healing.

PENETRATING VEHICLE

Propylene glycol is eleven times more penetrating than glycerin . . . carries medication to *every tiny crevice*. Urea encourages debridement.

TYMPACAINE Ear Drops Warren-Teed, ½ oz. plastic applicator bottles, cartons of 12 . . . detachable label for dispensing.

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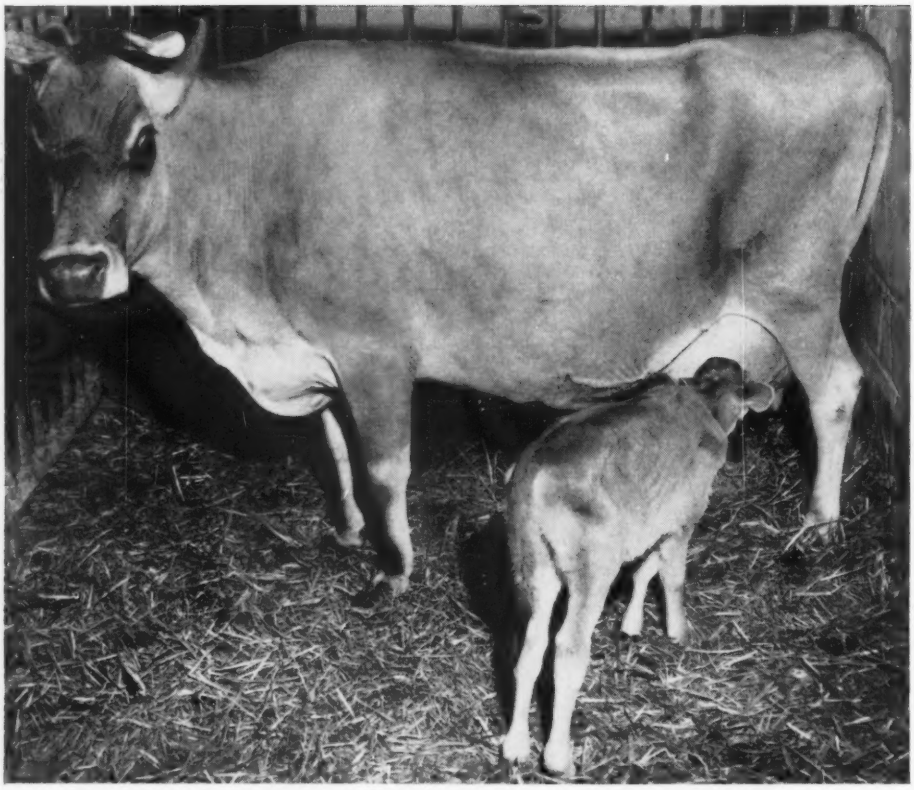
FALL FRESHENERS



RESULTS OF VACCINATION OF CATTLE WITH STAPHYLOCOCCAL BACTERIN-TOXOID

	No. of cows	Av. normal antitoxin titer	Av. antitoxin titer 1 mo. after 2nd injection	No. of infected quarters at time of vaccination	No. of infected quarters after 8 mo.	Acute infections during 8 mo.
Vaccinated*	45	12 I.U./ml.	33 I.U./ml.	46	40	10
Control	35	10 I.U./ml.	10 I.U./ml.	29	33	19

*Vaccination procedure: two injections of 10 ml. of bacterin-toxoid at four-week intervals.

STAPHYLOCOCCUS AUREUS TOXOID, SLANETZ STRAIN No. 7 is available in vials of 50 cc. and 250 cc.

Fall fresheners are doubly in need of the best possible protection against staphylococcal mastitis.

(1) Immediately following calving, the cow reaches her highest peak of production, and (2) during the fall and winter stabling period the highest incidence of mastitis occurs.

The seriousness of the problem of staphylococcal mastitis is steadily increasing as pointed up by the reports of many veterinarians who state that from 40 to 60 per cent of the cases they are called on to treat can be attributed to the persistent staphylococcic organism.

Vaccination with Cyanamid Staphylococcus Aureus Toxoid Slanetz Strain No. 7 should preferably be carried out prior to freshening, although this program also can be carried out effectively and safely at any point during the lactation period, as well as while the cow is dry. Procedure calls for 5 cc. intramuscularly, repeated in one month and annually thereafter.

Complete vaccination of the entire milking herd has proved effective in preventing the spread of staphylococcal mastitis to non-infected cows and preventing acute cases in cows already infected.

Cyanamid Staphylococcus Aureus Toxoid was developed and tested by Dr. L. W. Slanetz and his associates at the University of New Hampshire and has established a record of high efficacy in professional use by veterinarians.

Cyanamid has developed a complete, highly practical and effective mastitis control program around Staphylococcus Aureus Toxoid. This program attacks the mastitis problem in all its phases—and requires the dairyman to utilize the continuing supervision, guidance and professional services of his veterinarian.

If you would like the procedure booklet on the Cyanamid Mastitis Control Program, please write to Veterinary Professional Service Department, American Cyanamid Company, Princeton, New Jersey.

CYANAMID

STAPHYLOCOCCUS AUREUS TOXOID

Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

October, 1961

University of Illinois. 42nd Annual Conference and Extension Short Course for Veterinarians. College of Veterinary Medicine, University of Illinois, Urbana, Ill., Oct. 19-20, 1961. Dr. L. E. St. Clair, Department of Veterinary Anatomy and Histology, conference chairman.

Illinois Veterinary Medical Conference and Short Course. University of Illinois, Urbana, Oct. 19-20, 1961. Dean C. A. Brandly, College of Veterinary Medicine, University of Illinois, Urbana, Ill.

Gaines Symposium. University of Illinois, Urbana, Ill., Oct. 20, 1961. Mr. Harry Miller, Gaines Dog Research Center, 250 Park Ave., New York 17, N.Y., director of the Dog Research Center.

Midwest Feed Manufacturers' Association. Centennial Nutrition conference, Kansas City, Mo., Oct. 21-25, 1961. Fennell-Gibson Public Relations, 2201 Grand Ave., Kansas City, Mo.

Southern Veterinary Medical Association. Annual meeting. Thomas Jefferson Hotel, Birmingham, Ala., Oct. 22-25, 1961. Dr. A. A. Husman, Box 91, Raleigh, N.C., secretary.

Florida State Veterinary Medical Association. 32nd annual convention. Deauville Hotel, Miami Beach, Fla., Oct. 22-24, 1961. Dr. M. W. Emmel, P.O. Box 340, Gainesville, Fla., executive secretary.

California Veterinary Medical Association. Annual meeting. Long Beach, Calif., Oct. 23-25, 1961. Mr. Kenneth Humphreys, 3004 Sixteenth St., Rooms 301-303, San Francisco 3, Calif., executive secretary.

American Animal Hospital Association. Regional Meetings. Dr. Frank R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind., executive secretary.

Region 2. Hotel Patten, Chattanooga, Tenn., Feb. 11-12, 1962.

Region 3. Hotel President, Kansas City, Mo., Oct. 19, 1961. Burlington Hotel, Burlington, Iowa, Nov. 15-16, 1961. Secor Hotel, Toledo, Ohio, March 26-27, 1962.

Region 4. Mayo Hotel, Tulsa, Okla., Jan. 20, 1962. Texas Hotel, Fort Worth, Texas, Feb. 4, 1962. Colorado State University, Fort Collins, Colo., Feb. 18, 1962.

Region 5. Sheraton Meeting House, Honolulu, Hawaii, May 16-17, 1962.

Missouri, University of. 37th annual veterinary conference. Columbia, Mo., Oct. 30-31, 1961. Dr. Cecil Elder, Department of Veterinary Pathology, School of Veterinary Medicine, University of Missouri, Columbia, Mo., chairman.

(*Continued on page* 944)

The 613-R Dynaclave
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The 1022 Aristocrat Autoclave
Office pressure steam sterilization to hospital standards and convenience

EVERY VETERINARIAN

CAN NOW HAVE THE BENEFITS OF PRESSURE STEAM STERILIZATION

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Redesigned to meet the same exacting sterilization standards of the 8816, but at substantially lower cost and with greater capacity.

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Whether you are in private practice, research or in both, you need the protection offered by pressure steam sterilization of instruments, syringes, utensils, rubber gloves and related articles. This positive protection of your cases and yourself against cross contamination, is a comforting and practical safeguard.

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Send Bulletin on Autoclaves 613-R ☐ 8816M ☐ 1022 ☐ and location of nearest Amsco Dealer

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City _____ Zone _____ State _____

Meetings—continued from page 942

United States Livestock Sanitary Association. Curtis Hotel, Minneapolis, Minn., Oct. 30-Nov. 3, 1961. Dr. R. Hendershott, 33 Oak Lane, Trenton, N.J., secretary.

Veterinary Laboratory Diagnosticians. 4th annual meeting. Curtis Hotel, Minneapolis, Minn., Oct. 30-31, 1961. Dr. E. Pope, 4922 Holiday Dr., Madison 5, Wis., secretary.

National Assembly Chief Livestock Sanitary Officials. Curtis Hotel, Minneapolis, Minn., Oct. 30-31, 1961. Dr. M. N. Riemenschneider, 122 State Capitol, Oklahoma City, Okla., secretary.

National Association of Federal Veterinarians. Annual meeting. Curtis Hotel, Minneapolis, Minn., Oct. 31, 1961. Dr. F. L. Herchenroeder, Box 3085, Parkfairfax Station, Alexandria, Va., secretary.

November, 1961

Mississippi Valley Veterinary Medical Association. Hotel Pere Marquette, Peoria, Ill., Nov. 1-2, 1961. Dr. R. C. Williams, 3721 Fifth Ave., Moline, Ill., secretary.

Associations of Military Surgeons of the United States. 68th annual meeting. Mayflower Hotel, Washington, D.C., Nov. 6-8, 1961. Col. Robert E. Bitner, Suite 716, New Medical Bldg., 1726 Eye Street, N.W., Washington 6, D.C., secretary.

Michigan Nucleonic Society. Detroit, Mich., Nov. 10, 1961. Dr. L. E. Preuss, Department of Physics, Edsel B. Ford Institute for Medical Research, Henry Ford Hospital, Detroit 2, Mich., chairman.

American Public Health Association. 89th annual meeting. Cobo Hall, Detroit, Mich., Nov. 13-17, 1961. Dr. Berwyn F. Mattison, American Public Health Association, 1790 Broadway, New York 19, N.Y., executive director.

December, 1961

American Association of Equine Practitioners. 8th annual meeting. Hotel Texas, Fort Worth, Texas, Dec. 3-5, 1961. AAEP, 531 Guaranty Bank Bldg., Denver 2, Colo.

Kentucky Veterinary Medical Association. Annual meeting. Kentucky Hotel, Louisville, Ky., Dec. 4-5, 1961. Dr. L. S. Shirrell, 545 E. Main St., Frankfort, Ky., secretary.

January, 1962

Michigan State University. Thirty-ninth annual Postgraduate Conference for Veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 17-19, 1962. Dr. W. W. Armistead, dean.

(*Continued on page 946*)

Instructions to Authors

JOURNAL *of the AVMA*

1) *Exclusive Publication*: Articles submitted for publication in the JOURNAL of the AVMA are accepted with the understanding that they are not being offered for publication elsewhere.

2) *Manuscripts*, including footnotes, references, tables, and legends, must be typewritten, double-spaced, on 8½- by 11-inch bond paper, and the original and one carbon copy should be submitted. One-inch margins should be allowed on the sides with 2-inch margins at the top and bottom. Articles should be concise.

Purpose of the article should be stated in the introduction. Summary should be included.

3) *References* to published works should be brief and limited strictly to what is relevant to satisfactory exposition of the author's own work. Reference names are not permitted in the text of the article. Persons cited are to be referred to by superscript numbers only, relating to the reference list at the end of the article.

References should be typed double-space, in alphabetical order by author, as follows: author(s), title, periodical name, volume, year, and page(s).

[2]Mansson, J., and Obel, N.: The Technique of Adrenalectomy in the Ruminant. Cornell Vet., 48, (1958): 197-201.

When books are cited, name of publisher, location, edition, year of publication, and pages concerned should be given.

[1]Arey, L. B.: Developmental Anatomy. 5th ed. W. B. Saunders Co., Philadelphia, Pa. (1946): 236-240.

4) *Tradenames* of products are avoided in the text of the article. Use only generic or chemical names. The tradename may be included in a footnote along with name and location of producer (composition of product may be included if necessary): e.g., ". . . piperazine citrate* . . ." Footnote: *Piperol, Carson Chemicals, New Castle, Ind.

5) *Arabic numerals* should be used wherever digits are needed throughout the article except at the beginning of a sentence.

6) *Abbreviations* for weights and measures as given in standard dictionaries are usually acceptable, but some are determined by AVMA editorial preferences: e.g., Gm., gr., kg., cc., mg., cmm., Gm./kg., μg., mg./100 ml. Other abbreviations should be explained the first time they are mentioned either in parentheses or footnotes: e.g., ". . . pregnant mare's serum gonadotrophin (PMSG). . ."

7) *Photographs* should be furnished in glossy prints. Identifying arrows, letters, etc. within photographs should be clearly defined. All illustrations should bear the author's name, illustration number, and "top" side indication.

8) *Drawings*, graphs, and charts should be clear and large enough to allow for possible reduction in size. A glossy print should be submitted if possible.

9) *Tables* should be simple and typed double-space. Complex tables are not acceptable. Complex material should be summarized rather than tabulated.

10) *Legends* should be typed double-space on a separate sheet.

Sufficient information should be included to allow the illustration to be understood without reference to the text.

Frangible Bullets for Humane Slaughter

Since publication in March, 1959, of the original Humane Slaughter Law containing designations of approved methods, 3 amendments have been issued. The 1st recognized carbon dioxide as an acceptable method for immobilizing calves. The 2nd amendment made electrical stunning of goats permissible. The 3rd amendment (July 12, 1960) recognized the frangible plastic-iron bullet as a humane slaughter instrument. The .22 caliber plastic bullet produces immediate insensibility in all small stock and in all cattle with the possible exception of some breeds and aged bulls. The great value of the plastic bullet lies in its safety features for operating personnel. Its potential for ricocheting is negligible. A small part of this bullet actually penetrates the skull, but most of it is dispersed on the outside.—*Nat. Provisioner (March 4, 1961): 50.*

Meetings—continued from p. 944.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Okla., Jan. 21-23, 1962. Dr. W. D. Speer, 538 S. Madison, Tulsa, Okla., secretary.

Minnesota Veterinary Medical Association. Annual meeting. Hotel St. Paul, St. Paul, Minn., Jan. 22-24, 1962. Dr. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 24-27, 1962. Dr. Bert Reinow, Box 277, Pinedale, Wyo., president.

Kansas Veterinary Medical Association. Annual meeting. Broadview Hotel, Wichita, Kan., Jan. 29-31, 1962. Dr. M. W. Osburn, 1525 Humboldt, Manhattan, Kan., executive secretary.

August, 1962

American Veterinary Medical Association. Ninety-ninth Annual Meeting. Fontainebleau Hotel, Miami Beach, Fla., Aug. 12-16, 1962. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Foreign Meetings

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U.S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

Dr. Frank Fielder Promoted

Dr. Frank Fielder (COL '50) has been named manager of Schering Corporation's newly designated laboratory animal medicine and surgery department.

Since joining the pharmaceutical company in 1955, Dr. Fielder has been in the veterinary medicine and pathology and toxicology departments. He had been on the staff of the University of Pennsylvania's School of Veterinary Medicine from 1952 to 1955.

Dr. Fielder is a member of the AVMA, the New Jersey V.M.A., and the Australian Veterinary Association.

AVMA Research Fellowships Available

The Council on Research of the AVMA announces the availability of a number of fellowships for postgraduate training for the academic year, 1962-1963.

The recipient of a fellowship must be a veterinarian and a citizen of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year and who wish to follow a career in research may apply for a fellowship.

It is advisable that completed application forms be filed by Jan. 1, 1962, to allow time for correcting omissions and for some reasonable delay in arrival of letters of information from third parties. The latest date for filing the completed application is Feb. 1, 1962. Approximately one month is required for processing completed applications after receipt by the Council. Qualified persons should secure and submit applications as early as possible to insure their file being complete for presentation to the Committee on Fellowships.

The Committee on Fellowships of the Council on Research will meet early in March to consider applications and the awards will be announced soon afterward. The stipend will be determined in each case by the needs of the individual, the location of the school in which he proposes to work, and other factors. In general, the stipends range from $100 per month upward.

Any qualified person interested in graduate training may obtain application blanks and other information from the deans of the various colleges of veterinary medicine or by writing to the Council on Research, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.

Pfizer Acquires Globe Laboratories, Inc.

Globe Laboratories, Inc., producer of animal vaccines and veterinary pharmaceuticals, will become part of Chas. Pfizer & Co., Inc., under terms of a contract signed recently.

Pfizer will acquire the assets and business of the 42-year-old Fort Worth, Texas, company in exchange for 45,000 shares of Pfizer stock. The acquisition is subject to the approval of Globe share owners.

Globe, which will be operated as a division of Pfizer, maintains its headquarters, and its production and laboratory facilities, in Fort Worth, and has distribution units in Kansas City, Mo., Memphis, Tenn., and Indianapolis, Ind. Chief Globe products are vaccines, serums, and a general line of pharmaceuticals for livestock, poultry, and pets. The firm also markets veterinary surgical supplies, disinfectants, and insecticides.

A leading producer of antibiotics and other ethical drugs as well as industrial chemicals, Pfizer also produces human vaccines, and a line of animal feed supplements and veterinary specialties. Until now, however, Pfizer has not marketed vaccines for animals.

APPLICATIONS

Applicants Not Members of Constituent Associations

In accordance with paragraph (c) of Section 1, Article I, of the Bylaws, the names of applicants who are not members of constituent associations shall be published in the JOURNAL. Written comments received by the Executive Secretary from any active member regarding the application as published, will be furnished to the Judicial Council for its consideration prior to acceptance of the application.

SINGH, MAN M.
6 B Veterinary Hospital and Clinic, University of Missouri, Columbia, Mo.
G.B.V.C., Bihar Veterinary College, 1951
Vouchers: A. H. Groth and A. A. Case

JANSEN, GERARD J.
c/o U.S. Army Dispensary, Fort Niagara, Youngstown, N.Y.
D.V.M., Michigan State University, 1945
Vouchers: D. A. Swart and M. J. Herman

MUNIZ, CHARLES M.
6165 Allentown Rd., Washington, D.C.
D.V.M., Ohio State University, 1935
Vouchers: Frederick Weil and Roy E. Kyner, Jr.

SANDERS, GEORGE D.
2 Pine St., Avondale Estates, Ga.
D.V.M., University of Georgia, 1957
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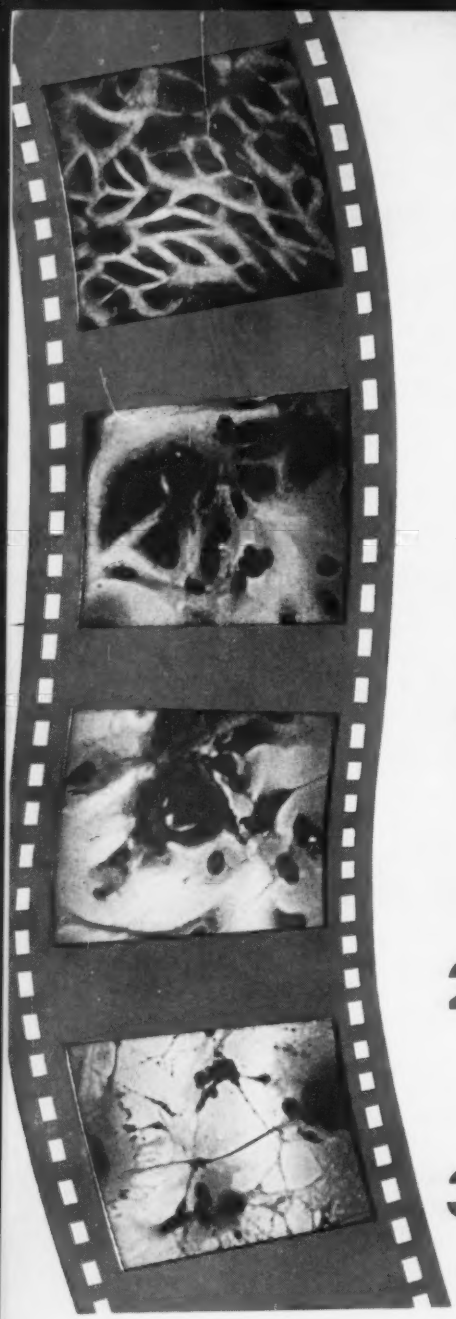

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Clinical and Research References:

1. Sinha, S. K., et al, Studies on Canine Distemper Immunization with a Tissue Culture Vaccine. Vet. Med., Vol. 55, No. 4, April 1960.
2. Burgher, J. A., et al, The Immune Response of Dogs to Distemper. Cornell Vet., Vol. 48, No. 2, 1958.
3. Paton, I. M., et al, Progress in Distemper Immunization. Jen-Sal Small Animal Topics, August 1960.
4. Dept. of Biological Research, Jensen-Salsbery Laboratories. Unpublished Research Data.

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